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Practical Pharmacy Edition

Editor

Robert W. Rodman

Committee on Publications

R. P. Fischelis, Chairman

B. V. Christensen

E. Little

E. F. Kelly

H. H. Schaefer

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Editorial

RESOLUTIONS TRANSFORMED INTO ACTION

IF ANY pharmacist wonders what has become of the resolutions approved by the Detroit meeting of this ASSOCIATION last August, he can learn the answer by consulting the report of the two-day meeting of the Council of the ASSOCIATION held in Washington, D. C., October 4th and 5th which is reported in this issue of the Practical Pharmacy Edition of the JOURNAL. At this meeting, within six weeks of the convention, the members of the Council gathered from various parts of the United States and sat down in the Library of the AMERICAN INSTITUTE OF PHARMACY to study carefully the 1941 resolutions and their implications. They set the wheels in motion which will carry out the actions of the convention to the fullest extent possible. Reports of officers and committees and the recommendations of Retiring President Evans and President Christensen were likewise considered carefully and acted upon. Every item of business referred to the Council was disposed of in a manner to assure its ultimate transformation into an accomplishment for the service of the members of the ASSOCIATION and the profession of pharmacy in general.

Some actions of the Council naturally stand out as more important than others. Among these are the expression of confidence in the continuous revision program of the U. S. P. and N. F. and the steps taken to assure the National Formulary's accomplishment of the desired end in full coöperation with the U. S. P.; the action taken on the problem of exempt narcotic preparations; the authorization of an experiment with a JUNIOR AMERICAN PHARMACEUTICAL ASSOCIATION among students of colleges of pharmacy; the effort to improve the status of pharmacists in the government services; the calling of an "All-Pharmacy Conference" to consider basic problems relating to the future of pharmacy in the United States and the submission of other fundamental proposals to the National Drug Trade Conference for action.

The move for an "All-Pharmacy Conference," suggested by President Charles H. Evans in his presidential address before the Detroit Convention and there endorsed, offers promise of developing into one of the most important conferences of its kind ever held.

The rapidly changing events of the past year have placed an added strain on all associations. Pharmacy, medicine, and dentistry have had to make strong representations to Selective Service officials to secure the judicious deferment of students needed to maintain an adequate supply of trained men in their respective fields. Pharmacy is faced with a real task in its efforts to secure a Pharmacy Corps in the Army. The campaign to control venereal disease has opened the eyes of public health officials to the importance of pharmacists in safeguarding the health of the American people. The new Civilian Defense program offers a real challenge to retail pharmacists. Shortages of drugs and the priorities system of the Office of Production Management present a pressing problem which demands unified, enlightened action.

It was felt by the Council that state association officers could being a viewpoint to the solution of these problems and, of equal importance, could obtain facts and first-hand

information which can be supplied to them at Washington, which would result in the launching of a unified program of action.

The Selective Service Office wants facts and figures on the supply and demand of pharmacists in the several states. A Pharmacy Corps in the Army will be possible only through the combined action of all pharmaceutical associations. The public health work and civilian defense program need state contacts to "follow through" on the work that has been done with national officials. The problem of drug supplies calls for intelligent, understanding advice to pharmacists.

At no time in recent years have the secretaries, editors and other officials of state pharmaceutical associations been so important to the profession. With their close contact with the pharmacists in each state, these officers are key men in the supply of information, the formulation of policies, and in the mobilization of pharmaceutical services.

If the pharmaceutical association secretaries of the country had first-hand information on these problems; if they had the opportunity to sit down around a table to discuss these matters with officials of the civilian defense movement, the Public Health Service, the Food and Drug Administration and other departments of the government, they would gain the background of information they need to use their power, influence and facilities most effectively in the interests of pharmacy and of the country.

What is the answer?

Obviously it is to invite these key individuals in every state to come to Washington and get the information they need to guide their actions. That is just what the AMERICAN PHARMACEUTICAL ASSOCIATION has in mind in calling an All-Pharmacy Conference in Washington as early in 1942 as possible. These men and women on the scene for a day or two can accomplish results which would be impossible to achieve through bulletins or letters. They will go back to their respective states armed with the facts they need to do a more effective job of leadership among their constituents, and the result of such inspired direction may well prove to make the difference between success and defeat in those objectives which all pharmacists seek.

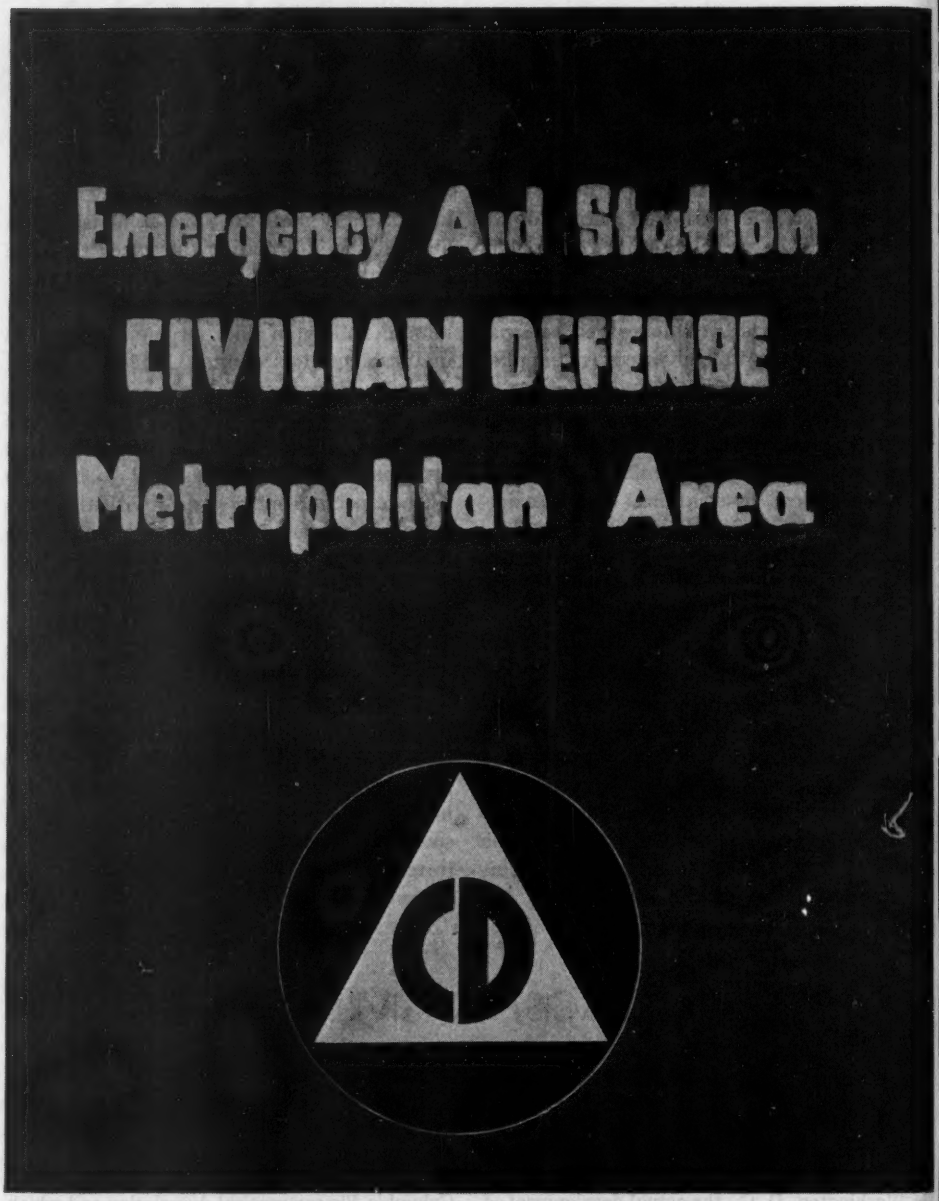
The calling of this conference is a recognition of the unprecedented demands which the present emergency is making upon pharmacy; it is also a recognition of the importance of the state pharmaceutical associations, their secretaries, and their officers in making it possible for pharmacy to meet these demands.

THE PHARMACIST IN CIVILIAN DEFENSE

WITH the entire nation mobilizing for service in the event of a national emergency, it is important that the pharmacist identify himself with the Civilian Defense Movement. Although an Office of Civilian Defense has been established in Washington, D. C., the actual development of plans is being left to Civilian Defense Directors in the respective states, and the operation of such plans will probably be handled by individual towns, cities, and counties.

If the pharmacist is to render the important services he is capable of contributing to the Civilian Defense Movement, he must lay before his local and state authorities the information they need concerning his facilities and training which may be relied upon in an emergency.

Elsewhere in this issue is published the Civilian Defense Plan developed by the District of Columbia Pharmaceutical Association and which has been accepted by the President of the Board of Commissioners of the District. It represents a comprehensive analysis of the services and facilities of the pharmacist and may well serve as a basic pattern for other state pharmaceutical associations in developing similar plans to meet their needs.



Artist's sketch of the sign, 11" by 14" in size, which is issued to each pharmacy in the District of Columbia which meets the requirements of an Emergency Aid Station. The background of the sign is red, the lettering is white, the background of the seal is blue with a white triangle and red letters. The pharmacist agrees to display one copy of the sign in the window of his pharmacy and one inside his store. The sign was approved by the Civilian Defense Director.

DISTRICT OF COLUMBIA MOBILIZES PHARMACISTS IN CIVILIAN DEFENSE

FIFTEEN-POINT PLAN DEVELOPED BY PHARMACEUTICAL ASSOCIATION AND ACCEPTED BY THE PRESIDENT OF THE BOARD OF COMMISSIONERS SHOWS HOW THE PHARMACIST'S SERVICES AND FACILITIES CAN BE UTILIZED EFFECTIVELY IN THE EVENT OF A NATIONAL EMERGENCY

JOHN Russell Young, President of the Board of Commissioners of the District of Columbia, has accepted a fifteen-point plan for the participation of pharmacists in the Civilian Defense Program submitted by the District of Columbia Pharmaceutical Association, and has ordered that all necessary details for its execution be arranged at once.

The plan was drafted by a special committee under the chairmanship of W. Paul Briggs, Dean of the School of Pharmacy of George Washington University and it represents the most comprehensive outline yet developed of the specific services which pharmacists are capable of rendering in a national emergency. Since the National Office of Civilian Defense has stated that state programs will be left up to the discretion of the Defense Directors of the individual states, pharmacists generally have been analyzing their services and facilities in an effort to determine how best they can be utilized in such programs. The District of Columbia plan may well serve as a pattern for pharmacists in other states and it is published in full with this article.

EMERGENCY AID STATIONS

Under the plan the establishments of retail pharmacists who qualify will be designated as *Emergency Aid Stations*. It is important to note this title because it carries a different meaning than *First Aid Station*. The experiences of Great Britain have shown that most pharmacies do not have the available space to enable them to serve as First Aid Stations and, furthermore, the large amount of glass in a pharmacy presents an added danger in a bombing attack. The District of Columbia Plan recognizes this fact but suggests that in practically every case a suitable temporary shelter can be found adjacent to the drug store.

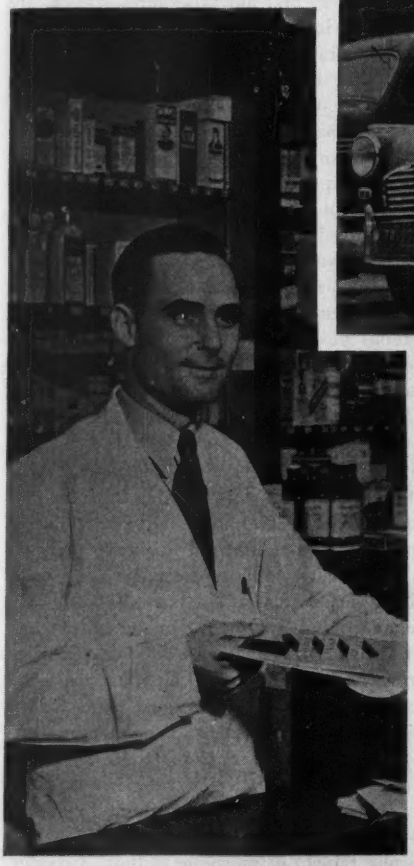
In drafting the plan, Dean Briggs called attention to the fact that pharmacists are acquainted with the use of emergency drugs and many have had training in first aid procedures. Plans are under way to institute a special first aid course for pharmacists in the District. Dean Briggs cited the strategic location of pharmacies, the fact that they are open the greater part of every day, that every pharmacy has at least one telephone and the majority have many more, that many pharmacies operate delivery trucks which could be pressed into service as ambulances, that the chemicals needed for re-charging of gas masks should be available from pharmacists because they know chemistry, that the de-centralization of stocks of emergency drugs by placing them in 379 retail pharmacies would lessen the hazard of damage by bombing, and that the pharmacist's education and experience made him invaluable both in disseminating public health information and in maintaining public morale.

In order to qualify under the plan, a pharmacist must fill out an application setting forth his telephone numbers; the names of his registered pharmacists, the number of delivery trucks he has; whether or not his pharmacy has a radio receiving set; whether there is a cellar under the store, and, if so, how many outside exits it has, and the names of employees who have completed a formal course in first aid. He must also agree to assemble and hold in one place, ready for immediate use, an emergency kit of certain specified drug supplies, a cot or mattress, a blanket, and a first aid manual. It is further expected that each pharmacy will be adequately stocked with tetanus antitoxin, ether for anesthesia, hypodermic tablets of morphine sulfate, hypodermic syringes and needles and other supplies which a physician would need in an emergency.

The applications are filed with the secretary of the pharmaceutical association who issues interior and window signs designating the pharmacies of those who qualify as *Emergency Aid Stations*. The association pays the expense of the signs and for the administration of the plan.

Left: Drug stores are strategically located to serve as Emergency Aid Stations.

Below: Many drug stores have delivery cars which, in an emergency, can be pressed into service as ambulances or for communication work.



Above: The pharmacist can distribute public health material.

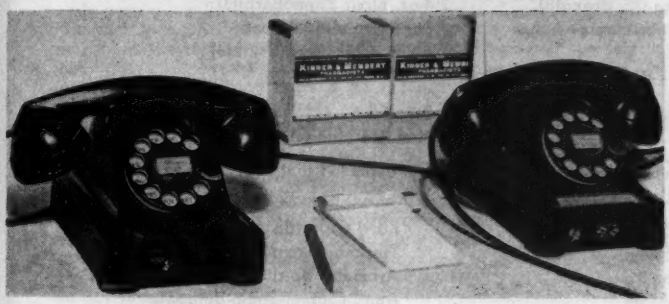
Right: The pharmacist's professional training is certified under the law.

Above: Most pharmacists have had formal training in First Aid procedures.

Right: Drug stores stock the vitamin products and special dietary foods required in the maintenance of health.

Below: The pharmacist knows his customers intimately and he is an important man in the maintenance of civilian morale.

Above: Every pharmacy stocks the narcotic and sedative drugs which the physician needs in an emergency.



Above: Every pharmacy has at least one telephone and many have more than one. In an emergency these communication facilities would be invaluable.

APPLICATION FOR LISTING AS DISTRICT DEFENSE COUNCIL EMERGENCY AID STATION

Part I

Name of Drug Store.....
Address.....
All Telephone numbers.....
Owners name.....
Names of all registered pharmacists.....
.....
.....
.....
Number of delivery trucks?.....
Radio receiving set in store?.....
Is there a cellar under store?.....
If so—how many outside exits?.....
Names of employees who have completed a formal course in First Aid.....
.....

Part II

I (we) certify that every item listed below will be available in.....
Drug Store located at....., Washington, D. C.

I (we) further certify that within 24 hours after receipt of the identifying emblem of a District Defense Council EMERGENCY AID STATION that I (we) will prominently display said emblem and will assemble and hold in one convenient place, ready for a emergency use, all of the listed items.

....
Date OWNER, Manager or Pharmacist in charge.

(Equivalent materials for any of the specific items listed will be acceptable.)

2 4-oz. Sterile absorbent cotton
2 Sterile Gauze Bandage 4-in.
2 Sterile Gauze Bandage 2-in.
25 Sterile Gauze Pads 3 × 3
1 Tourniquet Bandage or equivalent
1 Adhesive Plaster 3 in. × 10 yd.
1 Hot Water Bottle
1 Roll Paper Towels
1 Triangular Bandage
6 Paper Cups

1 Ice Bag
1 Flashlight
1 pkg. Splints (assorted)
1 pkg. Safety Pins
1 Basin
1 pr. Scissors
1 pkg. Swab Sticks and Tongue Depressors
1 Eye Cup
1 Sterno Stove
1 pr. Tweezers

1 Tube Burn Ointment
1 pt. Rubbing Alcohol
1 4-oz. Tincture Iodine (1/2 strength)
4 1/2-oz. Arom. Spirit Ammonia
2 4-oz. Sol. Boric Acid
1 2-dr. Butyn Sol. 2% (Dropper bottle)

2 1-oz. Sol. Ferric Subsulfate
1 bottle Mercuric Chloride Tablets
1 4-oz. Elixir Phenobarbital
1 cake Germicidal Soap
2 1/2-oz. Collodion (flexible)

1 Cot—Army or other type, or mattress or pad or stretcher
1 Blanket
1 First-Aid Manual

To meet the emergency needs of physicians, it is expected that every EMERGENCY AID STATION will have available emergency drugs such as:

Tetanus Antitoxin (Syringe pkg.)
H. T. Morphine Sulfate
Ether for Anesthesia
Hypo Syringe & Needles
Sutures (Sterile)

Ethyl Chloride
Thromboplastin (local)
Aromatic Spirit Ammonia (pearls)
Amp. Caffein-Sodio-Benzoate
Amp. Distilled Water

Part III

If this drug store is certified as a District Defense Council EMERGENCY AID Station the undersigned pharmacists pledge that they will promptly familiarize themselves with the principles of First Aid.

....

....

THE DISTRICT OF COLUMBIA PLAN AS SUBMITTED TO THE DEFENSE COUNCIL

I. There are approximately 750 practicing pharmacists in the District of Columbia whose qualifications to handle, dispense, and compound drugs and medicines are established by licensure under the laws of the District of Columbia.

II. These pharmacists are acquainted with the use of emergency drugs which are available in every drug store and the application of surgical dressings. They are familiar with the needs of physicians and the basic procedures of emergency, care of sick, and wounded.

III. Many of these pharmacists have had training in formal First Aid courses and plans are already being formulated to make training in first aid available to all registered pharmacists in the District of Columbia.

IV. The 379 drug stores in the District of Columbia are strategically located and open during the greater part of every day, providing a readily accessible center for civilian defense purposes.
Authorities have estimated that at least one member of every family in the city has occasion to visit a pharmacy once or more every week.
The well-trained pharmacist is the best informed person to disseminate public health information including methods for sterilizing water, general sanitation, use of antiseptics, burn dressings, and other emergency measures.
Thus the neighborhood pharmacist is in the best position to distribute published information and to supply prompt advice in times of emergency.

V. The supply of drugs, medicines, surgical and sick room requisites available in every drug store eliminates the need for establishing separate centers for supplying these items to the civilian population in time of emergency.

VI. The drug store itself may not be an appropriate place, because of limited space, to serve as a temporary refuge for sick and wounded but in practically every instance a suitable temporary shelter can be found adjacent to the drug store. On request the committee would survey such facilities and prepare a directory for emergency use.

VII. Many drug stores operate delivery trucks which in emergency could be converted to serve as ambulances for seriously wounded persons.

VIII. Every drug store has at least one telephone (the majority have many more) which would provide adequate communication service with a central headquarters as well as with physicians, nurses, and hospitals. Most drug stores are also provided with radio receiving sets.

IX. The administration of sedatives, hypnotics, and narcotic drugs is an important medical procedure in times of crisis. The neighborhood pharmacist having adequate stocks and knowledge of these drugs could, under the direction of physicians, ration daily supplies of such drugs. The pharmacist is the only person legally and professionally qualified to dispense these drugs.

X. The maintenance of morale is of the utmost importance during a national emergency. The pharmacist is probably acquainted with a larger number of persons than any other individual in a community. He enjoys their respect and confidence and if supplied with the necessary factual information could be an important stabilizing force in his immediate community.

XI. The maintenance of good health as the best protection against disease and infection is a service which pharmacists can render by advice on and supply of dietary supplements, vitamin products, and other preventive medicines.

XII. The distribution of gas masks could be efficiently carried out through the drug stores of the city.
Most types of gas masks require re-charging with chemicals. Supplies of these chemicals would be available in the drug stores, and the pharmacist's knowledge of these chemicals would make him the best qualified person to render this service to the civilian population.

XIII. The storage of large supplies of emergency drugs in a central depot presents a real hazard in the event of bombings. By de-centralizing these stocks through distribution to drug stores major losses could be prevented.

XIV. In any program for the civilian defense the pharmacist will be pleased to cöoperate with the medical profession to provide the best possible service to the civilian population.

XV. The District of Columbia Pharmaceutical Association, the individual pharmacists, and the drug stores of the city of Washington hereby place their facilities and personnel at the service of the District Defense Council for the duration of the national emergency.

N. F. AUTHORIZES SUBSTITUTION OF:

AMARANTH FOR CUDBEAR
BENZALDEHYDE FOR BITTER ALMOND

SCARCITY OF CUDBEAR AND OIL OF BITTER ALMOND DUE TO WAR LEADS THE NATIONAL FORMULARY TO ISSUE INTERIM REVISION ANNOUNCEMENT TO PERMIT USE OF SUBSTITUTES

BECAUSE World War II has made cudbear and oil of bitter almond practically unobtainable, the Committee on National Formulary of the AMERICAN PHARMACEUTICAL ASSOCIATION has issued an Interim Revision Announcement which permits, after October 15, 1941, the substitution of *amaranth* and *benzaldehyde*, respectively, for these two ingredients of N. F. VI preparations.

Amaranth is the trisodium salt of 1-(4-sulfo-1-naphthylazo)-2-naphthol-3,6-disulfonic acid, a coal-tar color of definite composition, standardized by the Food and Drug Administration as F. D. C. Red No. 2, specifications for which are listed in the Coal-Tar Regulations promulgated under the authority of the Food, Drug and Cosmetic Act. Pharmacists should specify *Amaranth, N. F. (F. D. C. Red No. 2)* in ordering this dye. It is a dark red-brown powder; 1 Gm. is soluble in about 15 cc. of water at 25° C.; and it is very slightly soluble in alcohol.

Both Tincture of Cudbear and Compound Tincture of Cudbear are used as coloring agents in National Formulary preparations, the compound tincture giving a darker color than the plain tincture. Under the Interim Revision Announcement, a five per cent weight-in-volume

aqueous Solution of Amaranth may be used in place of Tincture of Cudbear and the formula of a Compound Solution of Amaranth is provided to be used in place of Compound Tincture of Cudbear.

Sufficient Solution of Amaranth and Compound Solution of Amaranth should be used to simulate the color produced by Tincture of Cudbear and Compound Tincture of Cudbear. In preparations calling for Compound Tincture of Cudbear, an equal amount of Compound Solution of Amaranth will reasonably simulate the color, but there is no fixed relationship between the amount of Solution of Amaranth needed to simulate the color produced by Tincture of Cudbear in different preparations. The amount of Solution of Amaranth required to produce a satisfactory color in each of the National Formulary preparations which call for Tincture of Cudbear has been determined in the laboratories of the AMERICAN PHARMACEUTICAL ASSOCIATION, however, and is given in a table which appears with the Interim Revision Announcement.

BENZALDEHYDE SUBSTITUTION

The Interim Revision Announcement provides formulas for Compound Elixir of Benzaldehyde and for Spirit of Benzaldehyde which may be used in place of Compound Elixir of Bitter Almond and Spirit of Bitter Almond, respectively, in N. F. VI preparations.

INTERIM REVISION ANNOUNCEMENT NO. 3. NATIONAL FORMULARY, SIXTH EDITION.

Substitution of Amaranth for Cudbear as a Coloring Agent in National Formulary Preparations

By action of the Committee on National Formulary, and with the approval of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION, Amaranth (F. D. C. Red No. 2) may be substituted for Persio (Cudbear) as a coloring agent in N. F. VI preparations in which the latter is used as a coloring agent. When Amaranth is

TABLE 1

Preparation	N. F. VI Coloring Agent	Volume per Liter	Recommended Coloring Agent	Volume per Liter
Elixir Aminopyrinæ	Compound Tincture of Cudbear	10 cc.	Compound Solution of Amaranth	10 cc.
Elixir Ammonii Valeratis	Compound Tincture of Cudbear	30 cc.	Compound Solution of Amaranth	30 cc.
Elixir Aromaticum Rubrum	Tincture of Cudbear	20 cc.	Dissolve 2.5 Gm. Amaranth in 1000 cc. of Aromatic Elixir	.....
Elixir Cinchonæ Alkaloidorum	Compound Tincture of Cudbear	50 cc.	Compound Solution of Amaranth	50 cc.
Elixir Pepsini Compositum	Tincture of Cudbear	10 cc.	5% Solution of Amaranth*	6 cc.
Elixir Phenobarbitali	Tincture of Cudbear	7 cc.	5% Solution of Amaranth*	6 cc.
Liquor Aromaticus Alkalinus	Tincture of Cudbear	20 cc.	5% Solution of Amaranth.* Increase alcohol from 50 cc. to 60 cc.	10 cc.
Syrupus Bromidorum	Compound Tincture of Cudbear	16 cc.	Compound Solution of Amaranth	16 cc.
Syrupus Cinnamomi	Compound Tincture of Cudbear	60 cc.	Compound Solution of Amaranth	60 cc.
Syrupus Pini Albæ Compositus	Cudbear	1 Gm.	5% Solution of Amaranth*	7 cc.
Tinctura Persionis Composita	Tincture of Cudbear	150 cc.	5% Solution of Amaranth*	35 cc.

* Use a 5 per cent, weight in volume, aqueous solution of Amaranth.

used in place of Cudbear in the N. F. VI preparations listed in this announcement, it shall be employed in quantities which will reasonably simulate the color produced by Cudbear. If necessary, the alcohol content of the preparation involved must be adjusted to meet the requirements of N. F. VI. This action of the Committee on National Formulary is effective from October 15, 1941 until further notice.

The N. F. VI preparations which are directed to be colored with Cudbear or with Cudbear and Caramel, and the suggested concentrations of Amaranth to be used satisfactorily as a substitute are listed in Table 1. The formula for the Compound Solution of Amaranth suggested as a substitute for Compound Tincture of Cudbear in Table 1 is as follows:

LIQUOR AMARANTHI COMPOSITUS

Compound Solution of Amaranth

Liq. Amaranth. Comp.

Amaranth, 5 per cent aqueous solution	35 cc.
Caramel	100 Gm.
Alcohol	250 cc.
Distilled Water, a sufficient quantity,	
To make	1000 cc.

Dissolve the caramel in 700 cc. of distilled water, add the 5 per cent, w/v, solution of amaranth, the alcohol, and sufficient distilled water to make the product measure 1000 cc., and mix well.

Alcohol content—From 22 to 24 per cent, by volume, of C_2H_5OH.

Replacement of Compound Elixir of Bitter Almond and Spirit of Bitter Almond with Compound Elixir of Benzaldehyde and Spirit of Benzaldehyde in N. F. VI Preparations

The Committee on National Formulary, with the approval of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION, has voted to replace Compound Elixir of Bitter Almond and Spirit of Bitter Almond in N. F. VII with Compound Elixir of Benzaldehyde and Spirit of Benzaldehyde. The formulas for the new preparations are as follows:

ELIXIR BENZALDEHYDI COMPOSITUM

Compound Elixir of Benzaldehyde

Elix. Benzald. Comp.

Vanillin	1.0 Gm.
Benzaldehyde	0.5 cc.
Orange Flower Water	150 cc.
Alcohol	50 cc.
Syrup	400 cc.
Distilled Water, a sufficient quantity,	
To make	1000 cc.

Dissolve the benzaldehyde and the vanillin in the alcohol; add the syrup, the orange flower water, and sufficient distilled water, in several portions, shaking the mixture thoroughly after each addition, to make the product measure 1000 cc.; then filter until the product is clear.

Storage—Preserve Compound Elixir of Benzaldehyde in tight containers.
Alcohol content—From 3 to 5 per cent, by volume, of C_2H_5OH.
Preparation—Elixir Bromidorum Trium.

SPIRITUS BENZALDEHYDI

Spirit of Benzaldehyde

Sp. Benzald.

Benzaldehyde	10 cc.
Alcohol	800 cc.
Distilled Water, a sufficient quantity, To make	1000 cc.

Dissolve the benzaldehyde in the alcohol, and add sufficient distilled water to make the product measure 1000 cc.

Storage—Preserve Spirit of Benzaldehyde in tight containers.
Alcohol content—From 71 to 78 per cent, by volume, of C_2H_5OH.

AVERAGE DOSE—Metric, 0.5 cc.; Apothecaries, 8 minims.

One average metric dose contains 0.005 cc. of Benzaldehyde.

* * * * *

In view of the action taken by the Committee on National Formulary, notice is hereby given that from October 15, 1941, Compound Elixir of Benzaldehyde and Spirit of Benzaldehyde may replace Compound Elixir of Bitter Almond and Spirit of Bitter Almond as flavoring agents in all N. F. VI preparations in which the latter named Elixir and Spirit are ingredients.—JUSTIN L. POWERS, *Chairman*, National Formulary Committee.

Pharmacists will note that this Interim Revision Announcement is *permissive* in character. In other words, Amaranth *may* be used in place of Cudbear and Benzaldehyde *may* be used in place of Bitter Almond, but preparations using *either* coloring substance or *either* flavoring agent may be dispensed.

It is entirely possible that the current World War may cause shortages of other drugs, in which event additional Interim Revision Announcements will become necessary. Pharmacists are therefore urged to follow the pages of this JOURNAL closely for such official announcements concerning National Formulary preparations.

REPRINTS AVAILABLE

Reprints of the Interim Revision Announcement on Amaranth and Benzaldehyde may be obtained without charge by sending a self-addressed, stamped envelope to

Justin L. Powers, Chairman
National Formulary Committee
American Pharmaceutical Association
2215 Constitution Avenue
Washington, D. C.

A NEW WASHABLE OINTMENT BASE

by N. F. SORG and J. W. JONES

COLLEGE OF PHARMACY, STATE UNIVERSITY OF IOWA

COMBINATION OF GLYCERYL MONOSTEARATE, DIETHYLENE GLYCOL, CETYL ALCOHOL, AND GLYCERIN PRODUCES A VELVETY, WHITE, STABLE VEHICLE THAT WILL SPREAD WELL AND WILL WASH OFF

OLEAGENOUS ointment bases have been used for many years with questionable results in many cases. They are difficult to remove from the skin, they do not permit the medication they contain to be liberated freely, and, in some cases, they actually inhibit the therapeutic effect of the substances so administered.

The work of some investigators (1,2) shows that certain therapeutic agents contained in such bases as lard, petrolatum, and anhydrous wool fat are not absorbed by the skin as readily as when these agents are contained in hydrotropic bases which hold several times their weight of water.

Numerous investigators, reporting on Ointment of Phenol, have proved that phenol has no antiseptic value when incorporated in the usual oily bases(3,4,5,6).

The purpose of this work was to prepare a non-oily, water-free base from which the therapeutic agent would be readily available for absorption or action on the area to which it is applied. The further purpose was to compare the antiseptic effectiveness of various substances when incorporated in such a base and in the corresponding official bases.

Among the synthetic products which are suitable for the type of base desired are the water-soluble waxes, hydrogenated sulfonated oils and fats. Each type of material presents certain disadvantages such as low melting point, undesirable consistency or stickiness and, therefore an attempt was made to prepare an emulsifiable type of base. Such a base would contain no water and ointments made with it would not dry out. Several bases were prepared from varying proportions of glyceryl monostearate, cetyl alcohol and ethylene glycol.

A thesis presented in partial fulfillment of the requirements for the degree of Master of Science in the College of Pharmacy, State University of Iowa.

Presented before the Section on Practical Pharmacy, AMERICAN PHARMACEUTICAL ASSOCIATION, Detroit meeting, 1941.

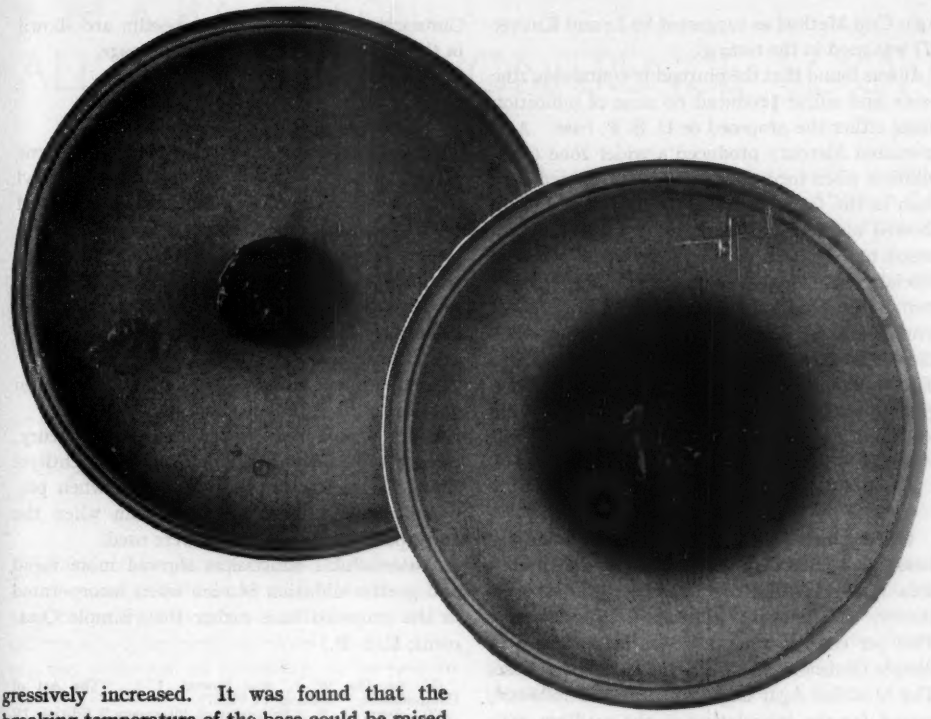
THE RIGHT COMBINATION

The first base studied was composed of 80 per cent glycerin, 15 per cent cetyl alcohol and 5 per cent glyceryl monostearate. The ingredients were heated to 90° C. in a beaker until melted, then stirred constantly with an electric mixture until cool. The resulting product had a velvety, white appearance, and was easily removed from the skin by washing with water. Ointments prepared with this base had good consistency, but were somewhat sticky when spread on the skin.

Since it was found impossible to determine the melting point of this type of base, it was tested for stability by heating it in a thermally controlled oven and observing the temperature at which separation occurred. The base was found to be unstable at 40° C.

In order to overcome the stickiness produced by glycerin in the base, ethylene glycol, propylene glycol, and diethylene glycol were used in the formula. The stickiness decreased in proportion to the amount of substitution, but the bases produced were less white and softer than the former one. The base containing propylene glycol possessed a peculiar liquefying effect when applied to the skin and was not considered further. Bases containing ethylene glycol and diethylene glycol were similar in appearance and washable properties. Ethylene glycol was chosen as the water-soluble phase of the next series of bases. In order to overcome the low-temperature breaking point shown in the first base, cetyl alcohol was substituted for a portion of the ethylene glycol, keeping the amount of glyceryl monostearate at 5 per cent. The results of this substitution showed that it was impossible to increase the amount of cetyl alcohol above 20 per cent without developing graininess due to the formation of crystals of the alcohol. It also showed that an amount of cetyl alcohol above 20 per cent caused the base to become too firm to spread well.

Another series of bases was prepared in which the amount of glyceryl monostearate was pro-



The zone of diffusion of 2 per cent of amaranth in Simple Ointment, U. S. P., after 12 hours of incubation, is 1 mm. (left). The zone of diffusion of 2 per cent of amaranth in this new ointment base, after similar incubation is 17 mm. (right).

gressively increased. It was found that the breaking temperature of the base could be raised by this method, but bases containing 15 per cent of glyceryl monostearate were difficult to prepare uniformly and the bases became too dry for use when the amount was increased to 20 per cent.

A SATISFACTORY FORMULA

In an attempt to improve the uniformity in the preparation of the base, equal parts of diethylene glycol and glycerin were substituted for ethylene glycol. This base was more easily prepared than any previously made. It had a white, velvety appearance, spread excellently, washed off easily, did not develop graininess, and had a breaking temperature above 40° C. The formula for this base, which was used in all subsequent experiments, is as follows:

Glyceryl Monostearate	15 Gm.
Cetyl Alcohol	15 Gm.
Glycerin	35 Gm.
Diethylene Glycol	35 Gm.

The components were heated together until all the solid particles were melted. The mixture was then stirred slowly until cool.

This base was used in preparing several official and non-official ointments. Medicaments incorporated in the base included ammoniated mercury, boric acid, phenol, salicylic acid, sulfuric, tannic acid, zinc oxide, and a combination of zinc oxide and ichthammol. All ointments were of good appearance when freshly prepared, but on standing the ointments containing boric and salicylic acids became unfit for use. Tannic acid caused a slight softening of the base while the remaining medicaments used elevated the temperature at which the base separated.

MORE ANTISEPTIC

The ointments prepared with the new base were compared in antiseptic potency with the U. S. P. ointments containing the same per cent of medicament. A modification of the F. D. A.

Agar Cup Method as suggested by Li and Kuever (7) was used in the testing.

It was found that the ointments containing zinc oxide and sulfur produced no zone of inhibition using either the proposed or U. S. P. base. Ammoniated Mercury produced a wider zone of inhibition when incorporated in the proposed base than in the U. S. P. base. Ointment of Phenol showed marked antiseptic value when the proposed base was used, but none when prepared officially. Zinc oxide ointment containing 2 per cent of ichthammol showed an antiseptic effect when the proposed base was used, but none when the U. S. P. base for zinc oxide ointment was used. Tannic acid ointment showed much greater antiseptic potency when the new base was used.

GREATER DIFFUSION

When a medicament is incorporated in an oily base, its availability for action on the injured area might be limited. In order to test this theory, the following diffusion test was made. Two per cent of amaranth was incorporated in Simple Ointment, U. S. P., and in the new base. The Modified Agar Cup procedure was followed, except for the inoculation of the medium with *Staphylococcus Aureus*. After the plates had been incubated for twelve hours at 37° C. the area through which the dye had diffused was observed. The zone of diffusion in the new base was 17 mm. as compared to 1 mm. in Simple Ointment. The comparative results are shown in the illustration on the previous page.

CONCLUSIONS

An ointment base composed of diethylene glycol, glycerin, cetyl alcohol, and glyceryl monostearate is non-oily, and is easily removed from the skin by washing with warm water.

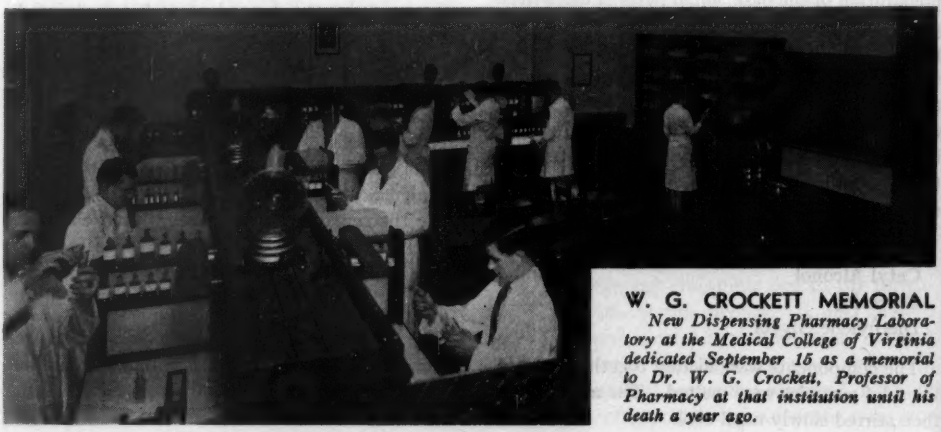
The proportions of the ingredients must be carefully balanced to obtain a base that has the proper consistency and a breaking temperature sufficiently high to withstand summer storage conditions.

The base was found to be non-irritating when applied to the unbroken skin.

Ointments containing ammoniated mercury, phenol, tannic acid and zinc oxide with ichthyol showed a greater antiseptic potency when prepared with the proposed base than when the corresponding U. S. P. bases were used.

Water-soluble substances showed more rapid and greater diffusion *in vitro* when incorporated in the proposed base rather than Simple Ointment, U. S. P.

(1) Scoville, W. L., and Powers, J. L., "The Art of Compounding," Edition VI (1937).
(2) Arny, H. V., "Principles of Pharmacy," Edition IV (1937).
(3) Prout, W. A., and Strickland, M., JOUR. A. PH. A., 26 (1937), 730.
(4) Reddish, G. F., and Wales, H. F., *Ibid.*, 18 (1929), 576–578.
(5) Bryan, A. H., *Ibid.*, 25 (1936), 606.
(6) Burnside, C. B., and Kuever, R. A., *Ibid.*, 29 (1940), 373–379.
(7) Li, P. L., and Kuever, R. A., *Ibid.*, 27 (1938), 1217–1221.



W. G. CROCKETT MEMORIAL

New Dispensing Pharmacy Laboratory at the Medical College of Virginia dedicated September 15 as a memorial to Dr. W. G. Crockett, Professor of Pharmacy at that institution until his death a year ago.

A. PH. A. PLANS TO CALL ALL-PHARMACY CONFERENCE SOON

STATE PHARMACEUTICAL ASSOCIATION SECRETARIES AND OTHER OFFICERS WILL BE INVITED TO WASHINGTON TO CONFER AND OBTAIN FIRST-HAND INFORMATION ON CURRENT PROBLEMS, A. PH. A. COUNCIL ANNOUNCES FOLLOWING MEETING TO ACT ON RESOLUTIONS AND THE RECOMMENDATIONS OF PRESIDENT CHRISTENSEN

EVERY state pharmaceutical association in the country will be invited to send its secretary, the editor of its journal, and other interested officers to a symposium on current problems facing the profession of pharmacy, to be held in Washington, D. C., early in 1942 under the sponsorship of the AMERICAN PHARMACEUTICAL ASSOCIATION, it was decided at a meeting of the Council, held at the AMERICAN INSTITUTE OF PHARMACY, Washington, D. C., October 4th and 5th, for the purpose of carrying out the actions recommended in resolutions approved by the Detroit meeting of the ASSOCIATION in August. The conference is the outgrowth of a recommendation of President Charles H. Evans, which was approved by resolution by the ASSOCIATION at its Detroit meeting last August, and has as its objective a frank discussion of certain national problems with which all pharmaceutical association officers should be fully familiar in order that each organization may coördinate the efforts of its members with those of other states and enable the profession as a whole to take more effective action in national affairs.

The past year has seen the development of many problems dealing with food and drug law interpretations, professional relations, selective service, civilian defense, and the present emergency on which the pharmacists of the country need careful guidance and the AMERICAN PHARMACEUTICAL ASSOCIATION recognizes the secretaries of the state pharmaceutical associations and the editors of state journals as key individuals in supplying this guidance. Although the Conference of State Pharmaceutical Association Secretaries holds meetings in connection with annual conventions of the A. PH. A., its sessions are devoted largely to discussions of their own problems. It is believed that every state association will profit by sending one or more representatives to the forthcoming All Pharmacy Meeting, where they will have the opportunity to exchange views and obtain first-hand information on national problems, hear government officials who have these problems within their jurisdiction and participate in a free and frank discussion of the action which organized pharmacy should pursue.

The Council appointed a committee of three to prepare an agenda of current problems for discussion and, after the list of subjects is agreed upon and a satisfactory date has been determined, invitations will be issued to the state pharmaceutical associations.

EXEMPT NARCOTICS

The Council received the report of its representatives who, with representatives of the N. A. R. D. had conferred with Commissioner of Narcotics Anslinger in an effort to have Brown Mixture, Stoke's Expectorant, and Lead and Opium Wash classed as exempt narcotics under a proposed amendment to the Narcotic Act, now being sponsored by the Federal Bureau of Narcotics. The amendment at present contemplates the removal of exemption from all preparations except those containing one grain of codeine or less per ounce. Commissioner Anslinger expressed the opinion that if Lead and Opium Wash should be continued as an exempt preparation, it may be necessary to require records of purchases and sales. He agreed to make studies of the extent of use of the three preparations under discussion and base his decision concerning these preparations on the results of such investigation. (*Note:* The Bureau of Narcotics asked manufacturers and wholesale dealers in narcotic drugs for sales figures on these three preparations in a questionnaire mailed October 6th.)

STUDENT BRANCHES

The increasing interest of students of pharmacy in the work of the ASSOCIATION, as shown by the number of student branches organized during the past few years, was discussed at considerable length and President B. V. Christensen urged that the activities of these groups be integrated into a JUNIOR AMERICAN PHARMACEUTICAL ASSOCIATION. Such a plan would give student branches the benefit of an interchange of ideas and would represent an extension of the present program of developing the interest of students in association work. A special committee was appointed to direct a trial of the plan in one or two districts during the coming year. At a later session the committee decided to use the New York area and the middle west as the two districts.

N. F. REVISION

Dr. Justin L. Powers, chairman of the Committee on National Formulary, reported on the progress of revision of the seventh Edition which is expected to be available the latter part of December. Upon Dr. Powers' recommendation, the Council approved the issuance of Interim Revision Announcements to permit the substitution of Amaranth for Cudbear and Benzaldehyde for Oil of Bitter Almond in N. F. preparations, but a recommendation that the substitution of Extract of Stramonium for Extract of Belladonna Leaves be permitted in the formula for Hinkle's Pills was referred back to the N. F. Committee for further study.

The Council discussed the continuous revision program of the National Formulary and adopted the following resolution:

WHEREAS, the enactment of the Food, Drug and Cosmetic Act has made imperative more frequent revision of the standards of drugs and medicines, and

WHEREAS, the need for more frequent revisions has become clearly evident during the last decade because of the development of many new medicaments, and

WHEREAS, both the United States Pharmacopœial Convention and the AMERICAN PHARMACEUTICAL ASSOCIATION are committed to the revision and issuance of the United States Pharmacopœia and National Formulary, respectively, at five (5) year intervals, and

WHEREAS, the National Formulary will be available in December 1941 and it is understood that the United States Pharmacopœia will be issued at approximately the same time, and

WHEREAS, this relatively early appearance of these compendia is conclusive evidence of the practicability and effectiveness of continuous revision, therefore, be it

Resolved, that in order to bring still greater efficiency and responsibility to the process of continuous revision of drug standards and actually to make it conform to a five (5) year schedule, the AMERICAN PHARMACEUTICAL ASSOCIATION through its Council has directed the Committee on National Formulary to maintain a program of revision which will assure the issuance of National Formulary VIII late in 1945, thereby permitting it to become official in 1946. And be it further

Resolved, that we reaffirm our belief that both the United States Pharmacopœia and the National Formulary should become official on identical dates and to this end the AMERICAN PHARMACEUTICAL ASSOCIATION bespeaks the fullest coöperation between the United States Pharmacopœia Committee and the Committee on National Formulary so that the revision of both books may proceed with uniform progress, thus permitting both the United States Pharmacopœia and the National Formulary to become official at the same time in 1946, this being advisable in the interest of the public, the allied medical professions and the drug law enforcement agencies both federal and state. And be it further

Resolved, that copies of these resolutions be forwarded to the Chairman of Revision of the United States Pharmacopœia, to the Chairman of its Board of Trustees and the President of the United States Pharmacopœia Convention.

INCREASED PERSONNEL

Action was taken by the Council to make effective the Resolutions passed at the Detroit Convention seeking to consolidate the activities of the ASSOCIATION by concentrating all editorial work at the Washington headquarters and providing an assistant to the Secretary.

Dr. Justin L. Powers, Chairman of the National Formulary Committee was named Editor of the Scientific Edition of the JOURNAL, effective January 1, and committees were appointed to act for the Council in the selection of an assistant to the Secretary and to confer on problems concerned with the employment of other office personnel.

HOSPITAL PHARMACISTS ORGANIZING

The Council received the tentative Constitution of the proposed National Conference of Hospital Pharmacists which is being formed as an outgrowth of the ASSOCIATION'S Sub-Section on Hospital Pharmacy. The tentative Constitution with By-Laws to be submitted later, was referred to the Committee on Affiliated Organizations for study.

A. M. A.—A. PH. A. CONFERENCE

Progress of the Conference on Medical-Pharmacal Relations, to be held between the American Medical Association and the AMERICAN PHARMACEUTICAL ASSOCIATION, was discussed. Representatives of both associations are working out the plans for the meeting and details, including the topics to be considered, will be announced within the near future.

PHARMACISTS IN GOVERNMENT SERVICE

The Council received a report of a meeting held recently in New York City by representatives of the A. PH. A., N. A. R. D., A. A. C. P., and N. A. B. P., at which the status of pharmacists in the Army, Navy, and other governmental services was discussed and work started on a program to provide greater utilization of pharmaceutical services in the various branches.

OTHER ACTIONS

Dr. William L. Sampson, of the Merck Institute of Therapeutic Research, was named to the Sub-Committee on Bacteriological and Biological Preparations of the National Formulary Committee.

The assistance of the A. PH. A. was offered to state pharmaceutical organizations in combating attempts to lower educational standards in the profession.

Reports on ASSOCIATION matters were received from Secretary Kelly, including the announcement that the PROCEEDINGS of the 1940 and 1941 meetings will appear in the November issue of the Scientific Edition of the JOURNAL.

Certain other resolutions as, for example, one dealing with physicians' samples, were referred to the ASSOCIATION'S delegates to the National Drug Trade Conference for discussion at its December meeting.

The two-day meeting was attended by 14 members of the Council and was under the gavel of Dr. Robert P. Fischelis, Chairman.

Justin L. Powers, has been named Editor of the Scientific Edition of the Journal, effective January 1, 1942. Dr. Powers was graduated by the College of Pharmacy, University of Michigan in 1919 with the degree of Ph.C., and served as Instructor in Pharmacy at Washington State College, until 1923, when he returned to Michigan to resume his studies. He received the degree of Bachelor of Science in 1924, taught for two years at the School of Pharmacy of Oregon State College, returned to Michigan and received his M.S. degree in 1927, and taught at Michigan until 1940, taking a leave of absence in 1935 to obtain his Ph.D. at the University of Wisconsin. In 1940 he became Chairman of the National Formulary Committee and Director of the Laboratories of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Druggists Digest

OF NEW FORMULAS, RECENT PHARMACEUTICAL DEVELOPMENTS, AND OTHER PROFESSIONAL DATA

DISADVANTAGES OF MINERAL OIL LAXATIVES

With the statement that "in some respects liquid petrolatum has earned its niche in the section of toxicology rather than in pharmacology," Dr. James W. Morgan, of the Department of Surgery, University of California Medical School, San Francisco, in the *Journal of the American Medical Association* for October 18, 1941 (117: 16, 1335–1336), warns that the use of mineral oil as a laxative has certain disadvantages which should be considered by physicians.

Dr. Morgan states that the use of mineral oil seems to be based on empirical considerations that make little sense when examined critically; its chemistry is uncertain; and its pharmacologic action is a matter of dispute, some saying it acts mechanically by softening the feces, others that it undergoes emulsification, and still others say it exerts an irritative action on the mucous membrane. He lists the following objections to the use of mineral oil:

1. It interferes with the normal physiologic process of defecation by destroying the competence of the rectosigmoid "valve" which then makes a reservoir for waste matter in the rectum rather than in the more proximal colon where ordinarily it may remain for some time without ill effect. The leakage of fecal matter into the rectum keeps this passage partially full most of the time with insufficient pressure to initiate the defecation reflex. The presence of this fecal matter in the rectum causes irritation.

2. When mineral oil is present in the rectum complete defecation is impossible; a mixture of oil and fecal matter always clinging to the rectal mucosa.

3. The ingestion of mineral oil interferes with the utilization of carotene, vitamin A, and fat-soluble vitamin D. These substances are soluble in mineral oil and when they come into intimate contact the vitamins are removed by the oil and pass through the system without being absorbed by the body.

4. Mineral oil speeds up the passage of a meal through the small intestine and, as a result, digestion is incomplete. Thus, many persons who have taken mineral oil over a long period of time complain of indigestion. Many show alarming loss of weight and strength.

5. Mineral oil interferes with the healing of postoperative wounds in the anorectal region and may induce hemorrhage. It interferes with the formation of healthy granulation tissue and makes proper hygiene difficult.

6. Leakage of small amounts together with fecal matter from the rectum may be an indirect cause of *pruritus ani* and definitely delays the cure of this condition.

7. Evidence is accumulating that mineral oil may be absorbed, producing pathologic changes in the liver and other organs.

SULFATHIAZOLE OINTMENT IN CUTANEOUS INFECTIONS

Using a 5 per cent sulfathiazole ointment, Drs. E. L. Keeney, R. H. Pembroke, F. E. Chatard and J. M. Ziegler, of Johns Hopkins and Union Memorial Hospitals, Baltimore, have reported the treatment of 69 patients with various skin conditions.

As reported in the *Journal of the American Medical Association* the ointment consisted of 5 per cent of sulfathiazole in a base of equal parts of hydrous wool fat and vanishing cream. Dr. Keeney, in a personal communication to this JOURNAL, advises that since the article was written he has been using a new ointment base of Aquaphor and cold cream with more satisfactory

results. The new formula for the ointment is as follows:

Sulfathiazole	5.
Aquaphor	25.
Ung. Aquæ Rosæ	70.

Sift the sulfathiazole through bolting cloth, incorporate it in the Aquaphor, and incorporate the cold cream.

Eight children, ranging in age from 5 to 24 months, suffering from infected infantile eczema were treated successfully. In 6 of the 8 infants that received application of the ointment over half the body surface 3 times a day, the concentration of sulfathiazole in the blood ranged from 2.0 to 3.5 mg. per 100 cc. Two children did not absorb the drug in detectable quantities.

Sixteen children, 2 to 6 years of age, with infected eczema of the face, arms and legs were treated with the ointment 3 times a day. The infection was controlled but the eczema was unaltered. Treatment with a 5 per cent carbonis detergens ointment was substituted and 13 out of the 16 cases became reinfected. Five per cent of sulfathiazole was then incorporated in the carbonis detergens ointment and this preparation gave dramatic and persistent improvement in both the infection and the eczema.

Three children, age 22 to 36 months, with eczema involving the skin between the buttocks and the thighs, were treated with the sulfathiazole ointment each morning and night. The eczema disappeared entirely in 10 to 14 days and had not recurred after 2 to 3 months. It is believed that the bacteriostatic action of sulfathiazole makes it effective in the treatment of chronic irritation due to ammoniacal diapers.

A 58-year-old man with a chronically infected eczema of the leg, of 30 months' duration, was treated with the sulfathiazole ointment twice a day. The condition showed dramatic improvement in 7 days and was completely cured in 10 weeks.

A 17-year-old woman who had had an infected seborrhea of the scalp during the late spring and summer since she was 3 years old was told to remove the scabs every morning, apply the sulfathiazole ointment every morning and night, and to wash the scalp every other morning with metaphen soap. After 10 days of treatment the scalp was entirely well and has remained so with the application of the ointment once a day and washing the scalp with metaphen soap once a week.

Five adult women with seborrheic dermatitis of the ears, of from 1 to 10 years' standing, were instructed to apply sulfathiazole ointment each morning and night to the auricles and to clean the external auditory canals, to the best of their ability, with a 5 per cent solution of sodium sulfathiazole. Dramatic relief was noted in 48 to 72 hours and the ears were well in 7 days. Treatment with the ointment at night was continued. Two of the patients who complained of intense itching were treated with sulfathiazole in a 5 per cent *carbonis detergens* ointment with great relief.

Twelve children with impetigo of the face, scalp or torso had the scabs removed every morning and the ointment applied each morning and night. Definite improvement was noted in 48 hours and in 7 days all the cases were cured.

Twenty nurses, aged 16 to 21 years, with acne were instructed to wash the affected parts every morning and night with soap and water and to apply the sulfathiazole ointment immediately. After 2 weeks 8 of the cases improved, after 4 weeks 2 more were improved, and after 10 weeks 13 in all were definitely improved. Five showed no improvement and 2 discontinued treatment.

Two patients with bacterial folliculitis involving the face applied the sulfathiazole ointment twice a day and in 2 weeks were greatly improved.

An adult patient with extensive furunculosis of both thighs following an operation for a rectal carcinoma was treated by having the furuncles covered with the ointment and the adjacent skin treated with the ointment 3 times a day. There was no further spread of the furunculosis and the furuncles present when the treatment was started immediately subsided.

Thirty-five patients with acute vesicular poison ivy dermatitis were treated with the sulfathiazole-carbonis detergens ointment and the lesions in every case healed without infection.

Thirty-three patients with cuts and 4 patients with small second-degree burns were treated with sulfathiazole ointment and the lesions of every one healed without infection.

The sulfathiazole ointment used in this study was prepared by Hynson, Westcott & Dunning, Inc., of Baltimore, and was developed as a preparation easily compounded by any pharmacist.

—*Jour. A. M. A., 117:17 (Oct. 25, 1941), 1415-1417*

CHEMOTHERAPY OF INTESTINAL PARASITES

With the possible exception of atabrine in the treatment of giardiasis, no present-day drug is completely satisfactory for the removal of intestinal parasites, and no one drug is useful against both protozoa and helminths, according to Dr. E. C. Faust, of the Department of Tropical Medicine, Tulane University of Louisiana, School of Medicine, New Orleans. Dr. Faust lists the "drugs of choice" in the treatment of different infections, as follows:

AMEBIASIS

Chiniofon is his first choice; diodoquin is second; carbarsone is third. Enteriovioform has had limited trial.

GIARDIASIS

Atabrine is apparently specific.

OXYURIASIS AND STRONGYLOIDIASIS

Gentian violet medicinal is the most satisfactory drug. In oxyuriasis a $4^1/_2$-hour coating is recommended. One grain is given 3 times a day for 8 days, followed by a week's rest, and the dosage is repeated for 8 days. In strongyloidiasis a $1^1/_2$-hour coating is recommended. One grain is given 3 times a day until 50 grains have been administered.

ASCARIASIS

Caprokol in hard gelatin capsules is his choice. Saline purgation before and after treatment is advised.

HOOKWORM

Tetrachlorethylene is his drug of choice. It should be preceded and followed by saline purgation. Caprokol is also satisfactory and is recommended for the treatment of small children, and aged or debilitated patients. Caprokol is his drug of choice in combined ascariasis and hookworm infections. Treatment with iron, blood transfusions, and a nutritious diet is recommended.

WHIPWORMS

There is no effective domestic anthelmintic against whipworms. Repeated administrations of tetrachlorethylene following saline purgation and enemas are recommended.

TAPEWORMS

Oleoresin of Aspidium is his drug of choice, with carbon tetrachloride second. Instead of the usual oral administration of the aspidium in divided doses, he suggests the transduodenal intubation of a suspension of 4 cc. of the drug in 30 cc. of mucilage of acacia and 30 cc. of a saturated solution of sodium sulfate.

—*Jour. A. M. A., 117:16 (Oct. 18, 1941), 1331–1335*

MORE ON SULFATHIAZOLE OINTMENT

Drs. W. M. Sams and L. Capland, of the Department of Dermatology and Syphilology of Dade County Hospital, Kendall, Florida, report the use of 10 per cent sulfathiazole in cod liver oil ointment in the treatment of common skin conditions such as impetigo and related ecthyma and pyoderma.

The crusts are removed at the first treatment and sulfathiazole powder is blown on the moist lesion. The patient is told to remove the crusts twice a day by applying the ointment for several hours. When soft, the crust is removed with soap and water and a small amount of sulfathiazole powder applied to the moist areas with a cotton applicator toothpick.

The cod liver oil ointment, to which 10 per cent of sulfathiazole is added, is made as follows:

Paraffin Wax	10
Petrolatum Alba	70

Melt together and allow to cool without agitation. After cooling add 8 drops of Upjohn's concentrated Super D Cod Liver Oil to each ounce of base.

—*Arch. Derm. & Syphil., 44:2 (Aug. 1941), 226–230*

A NEW ENTERIC COATING

A new enteric coating for tablets which depends, not on time or pH factors, but on their

fatty acid composition which is not digested by the gastric juice but forms a diffusible suspension with paired salts of sodium taurocholate and sodium glycocholate and disintegrates in the intestinal tract, has been developed by P. V. Maney and R. A. Kuever, of the College of Pharmacy, State University of Iowa, Iowa City, Iowa. The formula of the new coating is as follows:

Myristic Acid	68
Opal Wax	25
Castor Oil	2
Cholesterol	1
Sodium Taurocholate	4

(Opal Wax is E. I. du Pont de Nemours' hydrogenated castor oil)

The coating, kept warm at 50° C., may be applied in the ordinary manner using special precautions to build a coating of uniform thickness. No dusting powder is necessary. Hot and cold air are desirable to evaporate the solvent and harden the application. A number of applications are necessary to bring the coating up to the desired thickness.

Tablets so coated were found to remain in the stomach for as long as six hours and to disintegrate within two hours after entering the intestines.

—Jour. A. Ph. A. (Sci. Ed.), 30:10 (Oct. 1941), 276–282

BRITISH CUT STRENGTH OF MINERAL OIL EMULSIONS

Acting on the advice of the Therapeutics Requirements Committee of the Medical Research Council and the National War Formulary Committee that "an emulsion containing 25 per cent of liquid paraffin is as effective as the pure oil," the British Ministry of Health is issuing an order limiting such emulsions to this strength. Mineral oil is one of the substances on which strict economy must be observed at present in Great Britain.

—Pharm. Jour., 147:93 (Sept. 30, 1941), 107

CLOTHING AND COMFORT

Differences in clothing are the major reason why a room temperature that is comfortable to a man is too cool for a woman, according to C. P. Yaglou and A. Messer, of the Department of Industrial Hygiene, Harvard School of Public Health, Boston. As a result of this double standard most buildings are overheated in winter for the sake of women and over-cooled in summer for the sake of men.

Experimenting with healthy men and women, dressed in normal attire, in an air-conditioned room, the authors made the following observations:

1. A temperature of 72° F, a relative humidity of 30 per cent, and an air movement of 20 feet per second was comfortable to men but too cold for women. To make women comfortable the temperature had to be raised to 76° F.
2. When men and women wore similar clothes they were comfortable at about the same temperature.
3. Comfort is accociated with mean skin temperatures of 91.5° F to 93.5° F in both men and women. The mean skin temperature of women averages one-half a degree lower than men's under comfortable conditions.
4. If women would dress in winter with clothes comparable in warmth to men's clothes, they would be comfortable in a temperature of 72° F.
5. If men would take off their vests, coats, and collars in hot weather they would be comfortable at 83° F instead of 76° F to 80° F as at present.

MERBROMIN ACCEPTED FOR N. F. VII

The disodium salt of 2,7-dibrom-4-hydroxymercurifluorescein has been accepted for inclusion in N. F. VII under the title "Merbromin" by the Committee on National Formulary of the AMERICAN PHARMACEUTICAL ASSOCIATION. This chemical was introduced by Hynson, Westcott and Dunning, of Baltimore, under the proprietary name "Mercurochrome" and the patent on its preparation expires on April 21, 1942.

The new edition of the National Formulary will include standards for the chemical itself, for a 2 per cent aqueous solution, and for a 2 per cent surgical solution of the chemical in water, acetone, and alcohol.

Raising Digitalis for the Navy at the School of Pharmacy of the University of Minnesota during World War I.

PHARMACY THROUGH FIVE WARS

by JOHN E. KRAMER

REGISTRAR, PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE

EVERY ARMED CONFLICT OF THE UNITED STATES HAS LEFT ITS SCARS ON THE PROFESSION AS IT HAS ON OTHER CALLINGS, BUT PHARMACY RESPONDS TO EACH SUCCEEDING "CALL TO ARMS" AND TO-DAY IS BETTER PREPARED TO RENDER NEEDED SERVICES THAN EVER BEFORE

THE mutiny of the thirteen original States against the homeland, starting in 1775, had little or no effect upon pharmacy for the simple reason that pharmacy, in any shape resembling the profession as we know it to-day, was nonexistent then. With hardly an exception physicians wrote and dispensed their own prescriptions, with the slight help of an apprentice or two who, after compounding the evil messes prescribed by their employers for five or six years, might start off on their own in the healing arts. There was no supervision or organization of medical or pharmaceutical practice. It was merely "catch as catch can" curing, featuring such potions as boneset for consumption, catmint tea for colic, and using calomel, ipecac, jalap, and tartar emetic as purges. Asthma was treated by ordering the patient to smoke jimson weed. External cancers were plastered with pokeberries. Bloodletting was almost a cure-all. Superstition and credulity were rampant, as tales of ailments and remedies passed from person to person and from doctor to doctor.

Transportation being what it was in those days, wartime emergencies exerted no undue restrictions on the use of drugs. Most of the medicaments were local in nature, easily gathered and prepared, and, therefore, little could be missed through any lack of communication and trade with other parts of the world.

REVOLUTIONARY PHARMACISTS

However, above the hopelessly nondescript group of so-called professional people, a few names do stand out. One is that of Hugh Mercer, pharmacist, physician, Indian fighter, frontiersman and Revolutionary general. Adviser to General Washington in his apothecary shop in Fredericksburg, Va., Mercer was one of the few professional men of his time who realized what it meant to have fresh supplies of drugs at hand, and, despite the furor of the war, he insisted on securing a renewed stock of drugs from England every six months. As you know, the AMERICAN PHARMACEUTICAL ASSOCIATION has recently acquired the Hugh Mercer Apothecary

Presented before the Section on Historical Pharmacy, AMERICAN PHARMACEUTICAL ASSOCIATION, Detroit meeting, 1941.

Shop intact. It is a fitting shrine to all that pharmacy might have been in the days of the Revolution.

Another famous pharmacist of the time was Christopher Marshall, appointed by the newly organized American government to look after the medical needs of the Colonial soldiers stationed in Philadelphia. This was quite an honor, in view of the number of physicians in the city. Congress, too, gave additional recognition, little as it was, to pharmacy, for, in appointing various positions in hospitals being erected to take care of the 20,000 men in the army, the director-general and the chief physician were authorized to receive $4.00 per day, and the surgeons and the apothecary were ordered remunerated at the rate of $1.34 per day.

Probably the greatest benefit given pharmacy and medicine by the strife and turmoil of the Revolution was the recognition by medical men in charge of the hospitals of the need for a formulary or a book of standards. As a consequence, a 32-page, all-Latin pharmacopœia, the first in America, was compiled in Lititz, Pa., by the physician-general of the continental hospital located there, and it was printed later in Philadelphia "for the use of the military hospitals belonging to the Army of the United States of America." Replicas of this unique booklet are available now at the A. PH. A. headquarters in Washington.

THE WAR OF 1812

The War of 1812, again between the United States and Great Britain, found little change in the status of pharmacy since the days of the Revolution, and, therefore, it had about as much effect on the profession. The results of Dr. John Morgan's revolutionary idea in 1765 to have doctors write prescriptions and have pharmacists compound them was still being pondered over without any wide-spread immediate acceptance. The Academy of Natural Sciences, the first natural history society in the New World, was founded in that year by a far-seeing Philadelphia pharmacist and a few friends. The manufacture of pharmaceutical chemicals was being started in that same city. But the principal scientific advances in pharmacy, such as the discovery of iodine, the isolation of the alkali metals and alkali-earth metals, and the devising and the application of the principle of percolation were being made in Europe. Pharmacy in our country was at about its lowest ebb.

THE CIVIL WAR

By the time of the Civil War, when the United States was rent asunder for four long years from 1861 to 1865, pharmacy had redeemed itself somewhat. The first college of pharmacy in the country, in Philadelphia, had been conducting courses of study for apprentices for 40 years, and other colleges had come into being to follow suit. For nine years the AMERICAN PHARMACEUTICAL ASSOCIATION had been having annual conventions to carry out the original call to advance the true interests of the great body of pharmaceutical practitioners in all sections of the country under a code of ethics calculated to elevate the standard and improve the practice of their art. But the meeting of 1861, to have been held in St. Louis, was postponed due to "the disturbed condition of the country."

The prospect of a military draft reduced greatly the attendance at the 1862 meeting, those delegates who did attend coming from the northern portion of the nation. The War was pinching the pocketbooks of both sides, for the literature of the times describes a falling off of subscribers to pharmaceutical journals, and the absolute collapse of many publications. Prices of drugs, too, went up, and we can imagine quite some difficulty in the cotton situation, a commodity needed especially in war times. Rumors flew far and wide on both sides of the conflict, especially as to the high prices and scarcities in drugs in the enemy's territory. Denials, however, were promptly and mutually issued.

PHARMACISTS ASK RECOGNITION

An interesting commentary in the *American Journal of Pharmacy* for February 1862 is quoted here. "Occasionally, for many years past, apothecaries have been employed on some of our naval vessels to facilitate the duties of the surgeon; but from the fact that no rank attaches to the position, we are told, it is but little sought after, as the 'Surgeon's mate' is socially ill situated on ship-board. We are not aware that the apothecary has heretofore been employed in the medical department of the 'regular' army of the United States. The immense extension of this service at the present time has caused in many of the volunteer regiments the employ-

In Fredericksburg, Va., is the apothecary shop of Hugh Mercer, Revolutionary general and friend of George Washington. Established in a day when pharmacy was practiced by a hopelessly nondescript group of so-called professional people, this shop is a fitting shrine to what pharmacy might have been in that period. The shop is preserved by the Friends of Historical Pharmacy, Inc., affiliated with the AMERICAN PHARMACEUTICAL ASSOCIATION.

ment of apothecaries, especially in the regimental hospitals. The vital importance of an efficient and intelligent service in dispensing aid and medicines both on the battle field and in the general and camp hospitals is so self-evident that it will undoubtedly claim the attention of the proper authorities. To make this service more effective, it should be separated sufficiently from that of the surgeon to give a distinct standing and rank to the pharmaceutist, as in the French army, with clearly defined duties, that his proper self-respect, and ambition to be eminent in his sphere, may have ample room for display. Unless such an arrangement can be made, it is not probable that the better class of graduates in Pharmacy would seek positions of this kind."

It is interesting to note also the demeanor of the pharmacists toward the War, as evidenced in the call to the 1863 A. PH. A. meeting: "The aspect of the political horizon, though not favorable to our next meeting, will, we trust, become more encouraging long before that period arrives. The members will do well to proceed with their investigations and get their papers ready, so that when the meeting convenes, there will be something to engage its attention. We know how prone men are to be attracted from their ordinary duties by the occurrence of such events as are now happening near us, yet, while prepared to do our duty as citizens, we should not forget that our duty as pharmaceutists is to sustain our National Association."

Manufacturing pharmacy during the Civil War was taken over by the government so far as products for army use were concerned. In a laboratory in Philadelphia, under the supervision of an army doctor and a college professor, ether, sweet spirit of niter and chloroform were manufactured, pills of many descriptions were made, morphine and quinine were prepared, and "great economy attended the experiments." Most of the work was performed by girls but a few graduate pharmacists were also employed. A similar laboratory, at Astoria, Long Island, was destroyed by an accidental fire in 1865, at a loss of about $50,000, the chief items burned being opium, ipecac, calisaya bark, and cubebs.

Medical supplies in the Army of the North were described in detail in the April 1865 issue of the *American Journal of Pharmacy*, and it is interesting to note that our old army friends, iodine and epsom salt, were greatly in evidence even then, as were such miscellaneous items as cupping glasses, spittoons and, of all things, an obstetrical kit. A medical hospital pharmacy is also described, and the drug room seemed quite in keeping with the times. Pharmacists were employed by contract, twelve of them to a 3600-bed hospital, with a usual turnover of about 800 prescriptions per month. It was observed by the editors that no such gigantic military pharmaceutical operations had ever been carried on before, either in this country or in Europe.

Despite the domestic difficulties of internal warfare, and the demand by both armies for pharmaceutical service, pharmacy as a whole seemed to prosper during the Civil War. Exchange of materials and information with other countries continued, the A. PH. A. held increasingly successful conventions, and the key journals appeared regularly, replete with pharmaceutical knowledge not tinctured by the military. The colleges held classes regularly, even though enrollments were somewhat restricted. All of this recorded activity found by your reviewer was, however, in the North, but it is assumed that somewhat similar activities, albeit on a lesser scale, continued in the Confederate States. The close of hostilities must have been welcome to all who were enamored of their profession, for a Re-United States paved the way for better conditions of practice with careers unhampered and unhindered by stringent wartime restrictions and the possible call to arms or service in the medical corps.

SPANISH-AMERICAN WAR

Of relatively short duration, and not affecting the productive systems or the terrain of either of the participating countries, the Spanish-American War of 1898 was felt by pharmacists the least of all this country's major conflicts.

There was, however, an interesting development in the tax situation and its relation to products handled by the druggist. As was to be expected after a precedent established in the War of the Revolution and renewed during the War of 1812, the Civil War and even during minor emergencies, the country's Congress adopted a Spanish-American War Revenues bill which was signed by the President on June 13, 1898. Backed by the pharmacists and the pharmaceutical press as the logical means of collecting money to defray the expenses of the fight, the act taxed, among other things, cosmetics and medicinal proprietary articles and preparations at the following rate:

Articles retailing at 5 cents	1/8 of 1 cent
Articles retailing at 10 cents	1/4 of 1 cent
Articles retailing at 15 cents	3/8 of 1 cent
Articles retailing at 25 cents	5/8 of 1 cent
Articles retailing over 25 cents	5/8 of 1 cent
for each 25 cents or fractional part thereof	

Such taxes were collected by having the retailer attach to each package of a taxable commodity a stamp of the proper denomination. The pharmacist, of course, paid for the stamps as he purchased them from a government office.

As witness to the fact that the Act worked wonders in the matter of raising revenue, we note an editorial in one drug journal just five months after the issue in which the same editor had endorsed the bill. The second writing pointed out that hostilities were practically over and that the United States Treasury had, chiefly as a result of the tax stamps used, "the enormous available cash balance of $300,000,000." (Remember, this was in 1898, not 1941.) Accordingly, it was urged that this revenue act, which seemed to impose more than a just share of responsibility and hardship on the druggists and their customers, be repealed forthwith.

WORLD WAR I

World War I was most profound in its far-reaching effects upon American pharmacy. There

were war taxes on merchandise, drug imports were restricted, man power was depleted and various normal scientific activities were hampered. All of the evils of the past wars, and new ones, were inflicted on this country's professional people during the years from 1914 to 1918.

At the outset of the conflict, before America became involved, the only repercussions were evidenced in reduced shipments of crude drugs from other parts of the world. The German U-boat campaign was effective, and, as the war progressed, reserve stocks of pharmaceuticals from abroad became smaller and smaller until, in 1918, wide-spread experimentation was under way in the United States to determine the best methods for the domestic cultivation of such drugs as belladonna, digitalis, hyoscyamus, aconite, and others. It was soon found, unfortunately, that this could not be done as easily as had been predicted, for European growing conditions could not be fully matched in this country, and, in addition, there were so many intangibles necessary for the economic cultivation of crops that most ventures were not successful financially even though they did succeed in replenishing some few waning stocks.

To add to the burdens of those using crude drugs, shipments that did survive the transatlantic voyage were notoriously dirty and adulterated.

Research workers in the United States devoted much time to working out formulas for the use of saccharin and other substances as substitutes for sugar, a very scarce commodity. Glycerin was another pharmaceutical item on the list of rarities, and many substitutes were suggested with some being used successfully.

So great were the changes in pharmaceutical practice due to the scarcity of materials, the Committee of Revision of the U. S. P. was authorized to prepare and issue a supplement at any time they might deem such action desirable or necessary.

As was to be expected, costs of all drug items rose, reflecting noticeably in prescription prices.

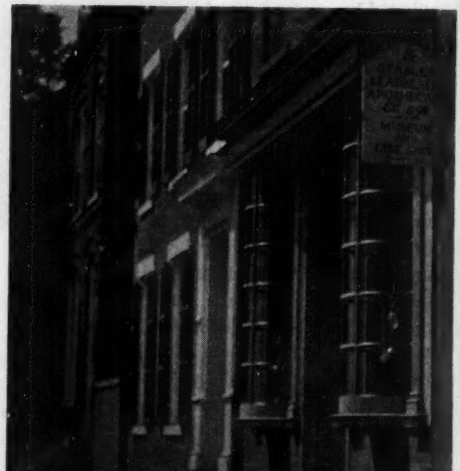
When War was declared between the United States and Germany, men from all walks of life rushed to the colors, pharmacists in the forefront. The draft helped deplete the ranks of those at home rendering professional service to the general public. Students in the colleges of pharmacy and those about to enter upon their studies were more than anxious to serve their country in the armed forces, causing a great reduction in the number qualifying for service at home. One college of pharmacy reported that one-sixth of its students and alumni left their domestic occupations for service in the Nation's name.

Many brave pharmacists who volunteered or who were called to duty never returned, and the profession is proud of those who made the great sacrifice.

It was at that time that women were urged most strongly to study pharmacy, and their response was most encouraging, for they made able substitutes for those at the front or in the various military units elsewhere.

Who among those who were on the scene at the time can forget the great "flu" epidemic that taxed the strength and endurance of every physician and pharmacist just when professional ranks at home were at a minimum? The loyalty of the men and women who carried on in the face of such handicaps was equal to that of the men who were in the service.

World War I brought the first organized effort to have pharmaceutical prestige recognized by



The Stabler-Leadbeater Apothecary Shop, in Alexandria, Va., in which Robert E. Lee received his orders to proceed to Harper's Ferry. The shop is preserved with the coöperation of the AMERICAN PHARMACEUTICAL ASSOCIATION.

the armed forces, which were only too pleased to utilize the pharmacist's services to the utmost, but would not advance him in rank. The justness and need for such recognition was proclaimed by the professional journals and the A. PH. A., but the seriousness of the emergency prompted them merely to list the needs, urge the establishment of a Pharmaceutical Corps in the United States Army, and let it go at that without attempting to worry the government authorities with something that was deserving, but not urgent.

However, it should be observed that the pharmacist who served as such with the army or the navy, practiced a profession quite unlike that of civilian life. Some even called it "canned pharmacy," and the ramifications and amplifications were admittedly not very great. In fact, the navy trained its own pharmacists in a short period of three months, and these men were able to perform their duties satisfactorily. The government never did get around to formal recognition of pharmaceutical service, so far as rank was concerned, during that war.

Pharmacists were again charged with the task of affixing tax stamps to packages of merchandise, but it was gladly done, efficiently and conscientiously.

Much of the testing of those pharmaceutical products used by the government in war service was done by the faculties and in the laboratories of the colleges of pharmacy, a gratuitous service that saved our Treasury many dollars.

The War, naturally, had some effect upon the progress of pharmacy in its general public health endeavors. That is to say, their activities were restricted a bit due to loss of man-power, and thoughts were turned toward wartime items. Beyond that, scientific work progressed apace, with accent on the domestic cultivation of drug plants and suitable substitution items. Stress was also laid on the development of better and more efficient antiseptics for use in military hospitals and on the battle field. Much experimentation was done here on the Carrel-Dakin and similar solutions, and a paraffin film for the dressing of burns received much attention.

But it was to the satisfaction of everyone in the profession that, when most other sciences were devising ways and means of destroying human life, pharmacy and medicine were straining to the *n*th degree to develop better methods for the conservation of human life and the return to health of those shot down and injured or made ill through the machinations of the gods of war.

WORLD WAR II

The rigors of the present World War II, even though the United States has not yet become embroiled in actual fighting, have already been felt by those practicing pharmacy and those utilizing its services. And it is almost uncanny how the difficulties of 1941 parallel those of 1914–1918.

Drug imports are once more on the wane, and again we hear the cry that American growers should make a declaration of independence in so far as crude drugs are concerned. But we are taking leaves from the diaries of 24 years ago and study is being given any domestic growing project before wide-spread activity is started. The botanical brains of the country should, however, be able to profit by past experience and make this country self-sustaining. The only difficulty about such an idea is that in all probability, just as it happened before, as soon as this self-sustaining program gets well under way, hostilities will cease and the natural preference for drugs from their own habitat will assert itself. But that remains to be seen.

A bit different from World War I is the fact that, since we are not actually in the war, not quite so many pharmacists and students are enlisting for active military duty. A goodly number have signed up with the armed forces and are serving admirably as pharmacists at the various military camps, naval hospitals, in the sanitation corps, and other places. The draft, too, has taken its share of young men from professional practice. But students in colleges of pharmacy have been given deferments and are being allowed to continue in their education, for governmental authorities have recognized the fact that a drafted pharmacy student is just another soldier, so to speak, while a student allowed to remain in college is a potential factor soon to be available for maximum service in military pharmacy or in public health work.

Thanks to the Committee functioning under the aegis of the A. PH. A., pharmacists are, for the first time, receiving just and due recognition by the army, and it is possible for men in that service to obtain the ranking of second lieutenant should their service and their merit warrant such promotion. In the navy, too, a pharmacist may rise to non-commissioned officership.

The place of pharmacy in military medicine has also advanced since the last war. Army and navy physicians are using a more diversified list of drugs and chemicals, and, due to the fact that the men in the service are not in actual combat, medical endeavors now are as much preventive as curative. Despite rumors to the contrary, and in face of unsatisfactory and uncompleted housing accommodations that recently greeted a huge untrained army of selectees taken from civilian life in the middle of winter, the physicians and pharmacists to whom they were entrusted have done a good job. It must be remembered that every man in the service is referred to the hospital for the most trivial illness that would go unnoticed or home-treated in ordinary life, and thus he becomes a "sick statistic." Even so, illness and mortality rates in camps and on board ship are below those in most municipalities.

The newer medicaments such as the sulfa-drugs, the vitamins, the serums and the antitoxins are helping in the never-ending army and navy fight against pain, sickness and disease, and the service officials owe much to the researchers who developed these modern medicines.

SHORTAGE OF PHARMACISTS

Even though this present threat of war is not drawing pharmacy's young life blood as thoroughly as was the case in the preceding struggle, the withdrawal of so many men from professional life now, combined with the fact that more rigid restrictions in college have decreased enrollments, is causing a definite shortage of qualified and registered pharmaceutical help, more so in certain parts of the country than in others. While the shortage is not yet acute, it is working some hardship, especially on the owners of one-man stores who cannot secure adequate relief. Some observers are of the belief that this will eliminate a great number of the "marginal" stores, the owners of which are living from hand to mouth and are contributing nothing to pharmacy or public health as a whole. If this eventuates, the shortage will be a good thing, and will permit better working conditions within the field, thus affording better service to the public. Whatever the outcome, there must not be any lowering of the requirements for entrance into the profession, for this would undo all the work of the colleges and the associations in deliberately planning, in the face of one of the worst depressions in the history of the country, to raise entrance and graduation requirements to bring about, eventually, just the condition that is coming into existence now. The advent of the war scare and the transfer of so many pharmacists into military duty has simply hastened the day to which so many level-headed, clear thinkers looked forward some fifteen years ago.

As before, more and greater opportunities are being cast toward properly qualified women in the field, and we are sure that they will take advantage of them and deport themselves well. They always have.

Again, costs of drug commodities are rising, slowly but surely, yet the prices of prescriptions to the public have not been affected tremendously. It is sincerely hoped that this will not eventuate, and it is also hoped that druggists will not be forced to start sticking tax stamps on merchandise. Yet, it must be conceded that some means must be conceived to raise the revenue necessary to carry on our defense and armament program. If pharmacists can coöperate, they may be counted upon to do so to the best of their ability, but the tax collectors have learned much in past years, especially during the late lamented depression, and they have probably ascertained that it is much easier to collect taxes at source, rather than have every merchant on every corner act as a government agent.

PHARMACY RESPONDS

As has been indicated, every major armed conflict entered into by the United States has inflicted some hardships upon the professions, even as it has upon every other calling and every other person in the country. But the healing arts, taxed to capacity under normal conditions, are called upon to serve even more in times when people are wounded, maimed, overworked, and worried.

In every emergency so far in the history of this glorious country of ours, pharmacy has responded beautifully and beyond reproach, and it is doing so again and may be expected to continue to do so if world conditions so dictate, for, fortunately, the profession is in better condition for such service now than it has ever been before—in organization, in scientific background, in willingness and in general morale.

PHARMACY WEEK WIDELY OBSERVED

THREE RADIO ADDRESSES OVER NATION-WIDE SYSTEMS CARRY STORY OF PHARMACY TO MILLIONS DURING WEEK

FROM all reports the seventeenth annual observance of National Pharmacy Week was the greatest in the history of this event. In addition to innumerable local radio addresses heard in all sections of the country, three leaders of pharmacy, Dr. B. V. Christensen, President of the AMERICAN PHARMACEUTICAL ASSOCIATION, Dr. C. Leonard O'Connell, Dean of the University of Pittsburgh College of Pharmacy, and Dr. Hugo H. Schaefer, Dean of the Brooklyn College of Pharmacy of Long Island University, broadcast messages to the American public over the nation-wide facilities of the major broadcasting systems.

President Christensen, speaking over the Columbia Broadcasting System on Friday, October 24th, said, in part:

"From time immemorial and by all classes of people drugs and medicines have been used to assist nature in the alleviation of pain and the cure of sickness and disease. These drugs and medicines when properly prepared and administered in the correct doses are boons to mankind but when improperly prepared or administered in large doses become dangerous poisons and may permanently injure the health or even cause the death of the individual who takes them. Again, experience and practice has demonstrated that it is frequently advisable to mix two or more drugs in order to bring about a more effective relief or a more rapid cure than could be obtained from one alone. Here, again, it is essential that this compounding process be performed in the right manner to produced the desired results. In many cases if the mixing process is not carried out in the correct manner a dangerous product may be formed or the effect of the drugs may be neutralized so that the patient is either harmed or gets no relief from the medicine.

"The pharmacist is thoroughly trained in the science and art of properly preparing and compounding drugs and medicines and putting them up in the right dosage for the individual patient for whom they are intended. It is because it was recognized years ago how essential it is to the well-being and protection of the public that the people be guaranteed a safe and efficient pharmaceutical service that laws were enacted restricting the practice of pharmacy to properly qualified persons. The result is that the pharmacist of to-day must be a graduate of a recognized college in which he has successfully mastered courses in botany, bacteriology, physiology, pharmacy, pharmacognosy, pharmacology, and pharmaceutical chemistry. He must have served an apprenticeship where he has learned directly from the experienced pharmacist and has performed many of the practical operations of the pharmacist under careful supervision. Then he must pass examinations—vigorous tests administered by State Examiners. Hence, the modern pharmacist is prepared to meet the exacting demands which present-day conditions require in the field of drugs and medicines. Your pharmacist is prepared to properly compound the medicines you may require and to provide you with pure and effective drugs dispensed in the correct dosage. The pharmacist is the drug expert in your community.

"Life often depends on the knowledge and skill of the pharmacist. The fine art of the pharmacist

The role of pharmacy in the field of public health was discussed by Dean C. Leonard O'Connell over the Red Network of NBC.

is more than the mere mixing of ingredients. It is the art of preparing, preserving, compounding and dispensing of medicines based on a thorough knowledge of the fundamental scientific principles involved and the multiplicity of skills and techniques required. He must know the purity of every ingredient he uses; he must know the action of each medicament he dispenses and he is legally charged with the responsibility to see that the amounts prescribed by the physician are correct. The lives of his patrons are in his hands.

"Pharmaceutical service is becoming more widespread and it is becoming better year after year. Medicines are not as difficult to take as they were fifty years ago. They are put up in convenient, attractive and palatable form. Every year our medicines become more elegant and more attractive in appearance and more effective in their medicinal qualities. This progress indicates that the pharmacist is keeping pace with changes and advances in the scientific field and is applying these in modifications of his practice. All of these make medical treatment more effective than ever before and the health of the nation is regularly improving. It is inconceivable how the nation could get along without the pharmacist."

IN THE NEWS

Dr. George D. Beal, Assistant Director of the Mellon Institute of Industrial Research, Pittsburgh, will receive the Remington Medal for 1941 at a testimonial dinner tendered in his honor by the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION on December 4, 1941, at the Hotel Pennsylvania, New York City. Frank J. Pokorny, 115 West 68th Street, New York, N. Y., is chairman of the committee arranging the dinner.

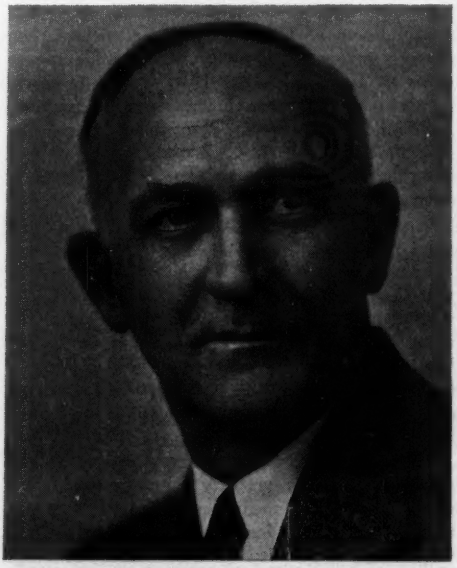
Dr. John N. McDonnell, Assistant Professor of Pharmacy at the Philadelphia College of Pharmacy and Science, and editor of the *American Professional Pharmacist,* has accepted appointment as head of the Health Supplies and Drug Division of the Bureau of Research and Statistics of the Office of Production Management, Washington, D. C.

Hugh P. Beirne, newly elected President of the National Association of Retail Druggists, will be tendered a testimonial dinner by the Connecticut Pharmaceutical Association at the Seven Gables Inn, Milford, Conn., on November 11th.

Dr. Paul J. Jannke is directing the study of sclerosing agents at the University of Nebraska School of Pharmacy under a grant of the AMERICAN PHARMACEUTICAL ASSOCIATION, instead of Dr. Joseph B. Burt, as reported in this JOURNAL for September.

William M. Bristol, Jr., Vice-President and Director of Bristol-Myers Company, New York City, has been appointed chief of the Health Supply unit of the Purchasing Division of the Office of Production Management, Washington, D. C.

Dr. F. A. Gilfillan has been appointed acting president of the Oregon State College, Corvallis, Ore. Dr. Gilfillan was graduated by the School of Pharmacy of that institution in 1918 and received the degree of Doctor of Philosophy from Yale University in 1921. He has had several years of drug store experience and was connected with the Calco Chemical Company for one year. He served as Professor of Pharmacy at the University of Florida for two years and has been a member of the faculty of the School of Pharmacy of Oregon State College for fourteen years. In 1938 he was appointed Dean of the School of Science of that institution, which comprises all of the departments of the physical and chemical sciences on the campus.



DR. F. A. GILFILLAN

"A Hospital Pharmacy without a Registered Pharmacist Is Like an Operating Room without a Surgeon" was the title of an interesting exhibit of the New Jersey Board of Pharmacy at the recent meeting of the American Hospital Association, held in Atlantic City, N. J. The exhibit pointed out the requirements for registration as a pharmacist, the functions of the Board of Pharmacy, the requirements of the American College of Surgeons with respect to hospital pharmacies, and the advantages of proper pharmaceutical service to a hospital.

OBITUARY

WILLIAM PERRY PORTERFIELD

William P. Porterfield, of Fargo, N. D., Honorary President of the AMERICAN PHARMACEUTICAL ASSOCIATION 1940–1941, died on October 9th at Harrisburg, Pa. He was 85 years of age.

Mr. Porterfield was born in Martinsburg, W. Va.; he was educated under a private tutor and later was graduated by the Philadelphia College of Pharmacy and Science. He was engaged in the practice of pharmacy in Fargo until 1912. He had served as president of the North Dakota Pharmaceutical Association; a member of the North Dakota Board of

WILLIAM P. PORTERFIELD

Pharmacy for 23 years, serving as its president for the last two; president of the National Association of Boards of Pharmacy, and a member of its executive committee. He served in the North Dakota State Senate and was a member of the Fargo Park Board for thirty years.

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PURDUE UNIVERSITY, SCHOOL OF PHARMACY

SODIUM ALGINATE OR METHYL CELLULOSE MAY BE USED IN ALMOST ANY PHARMACEUTICAL PRODUCT WITHOUT DECREASING VALUE OF THE PREPARATION

MUCILAGES are thick, viscid, adhesive liquids or semi-solids produced by dissolving a gum in water or by extracting with water the mucilaginous principles from vegetable material. The natural gums are a peculiar class of bodies which occur as the juices or in the juices of plants. Some gums dissolve completely in water; others merely hydrate and swell in water; and still others are almost completely insoluble. The mucilages obtained from gums are physically and chemically stable, but they are subject to mold growth and require the use of preservatives.

This study was undertaken with the following purposes in view:

1. To determine from which of the natural gums pharmaceutically useful mucilages could be obtained.
2. To make a comparative study of the applications of the mucilages in the manufacture of various pharmaceutical preparations.
3. To study the effects of certain preservatives in the mucilages.

Recently, new substances whose water solutions exhibit mucilaginous properties have been introduced into professional and industrial pharmacy. Two of the substances, namely, sodium alginate and methyl cellulose, were considered at length in this study.

SODIUM ALGINATE

Algin (alginic acid) and sodium alginate were first studied by Stanford (1, 2, 3, 4), who obtained algin by macerating the long fronds of *Laminaria stenophylla* in sodium carbonate, filtering and precipitating the alginic acid in the filtrate by adding hydrochloric acid. Stanford then prepared sodium alginate simply by dissolving the alginic acid in sodium carbonate. These two products are, at present, prepared analogously. Lunde, Heen and Öy (5) purify alginic acid by treating it with alcohol or hydrochloric acid. They purify sodium alginate by washing it with alcohol or ether.

Sodium alginate can be dissolved in water in concentrations up to five per cent to produce true solutions, semi-mucilages and transparent gels. Solutions containing one per cent sodium alginate have a viscosity of about 1000 CPS at 17° C.; at a concentration of five per cent an immobile gel is formed. The mucilage is most easily prepared by suspending the powdered gum in sufficient glycerin and adding hot or cold water to that mixture with continuous stirring.

The addition of calcium ions to the mucilage in the form of slurried calcium citrate results in a thickening effect from the precipitation of calcium alginate as a jelly. All metallic ions, other than those of the alkalies, magnesium, and ammonium, behave in a manner similar to calcium. Aside from this effect, the sodium alginate mucilage is compatible with salts of alkali metals, proteins, gums, soaps, starches, sugars, soluble oils, glycerin, ethylene glycol, and wetting agents.

The mucilage must have a preservative added to it to prevent decomposition by fungal, bacterial and fermentation processes which cause a complete deterioration of the mucilage (6).

METHYL CELLULOSE

Although methylated cellulose has been known in organic chemistry for a number of years, it was not until recently that its pharmaceutical applications were conceived. According to a British patent (7) methyl celluloses are produced by treating semi-moist alkali cellulose at below 10° C. with dimethyl sulfate. The ethers thus obtained yield soluble products when they are

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suspended in aqueous sodium hydroxide, cooled to below 0° C., and then thawed.

Mucilages of methyl cellulose are prepared most rapidly by mixing the methyl cellulose fibers with about half the required quantity of water which has been brought to boiling temperature. This mixture is allowed to macerate for about half an hour, and the remaining water is added either as cold water or as ice.

Mucilages of methyl cellulose are stable over a long period of time and require no preservative; however, the methyl cellulose has no preservative action attributed to itself.

The mucilages are compatible with alkalies and with dilute acids, including boric, phosphoric, acetic, citric and tartaric acids, but they will not tolerate tannic or phosphotungstic acids. They are compatible with aqueous solutions of soaps, water-soluble resins and with most wetting agents. They can be blended with aqueous dispersions of starch, glue, casein, dextrin, and water-soluble gums.

Methyl cellulose can be coagulated from its aqueous solution by saturated solutions of many salts, including the sulfates, chlorides, and nitrates. Heating will cause gelatinization, but cooling returns them to their original smoothness and fluidity.

In order to obtain a comparative study, mucilages were attempted with as many gums as it was possible to obtain. They were prepared, where possible, according to established formulas. The mucilages which were selected for further study were those of Acacia, Chondrus, Karaya, Okra, Pectin, Quince, Tragacanth, Sodium Alginate, and Methyl Cellulose.

Each of these mucilages was incorporated into several series of preparations, and their effects in those preparations were noted.

VEHICLES IN HAND LOTIONS

(*a*) *Translucent Type.*—The mucilages were incorporated in emollient hand lotions, containing alcohol-soluble oils and gums. Usually quince seed mucilage or a mucilage of tragacanth of low concentration is employed for this purpose.

(*b*) *Saponifying Type.*—In order to investigate the possible saponifying properties of the mucilages, they were employed in a formula containing almond oil and free stearic acid.

(*c*) *Saponified Type.*—In this series, the almond oil and free stearic acid were saponified with triethanolamine, and the mucilage then acted only as a vehicle for the resulting soap.

Table I shows the summary of the results obtained in each of the foregoing preparations.

EMULSIFYING AGENTS

The emulsifying properties of the mucilages were tested in emulsions of liquid petrolatum and cod liver oil; in each case quantities of the oils were emulsified with identical quantities of the mucilages. Samples of each preparation were homogenized, and the effects of homogenizing were noted.

Table II shows a summary of the results obtained in each emulsion.

SUSPENDING AGENTS

The mucilages were used to suspend the zinc oxide-calamine combination found in the official

TABLE I—GUMS AS VEHICLES FOR HAND LOTIONS

Value as A	Vehicle for Translucent Type	Saponifying Agent	Vehicle for Saponified Oil
Acacia	Good	Fair	Separated
Chondrus	Separated	Unsatisfactory	Good
Karaya	Good	Unsatisfactory	Thick
Okra	Unsatisfactory	Unsatisfactory	Fair
Pectin	Very good	Unsatisfactory	Good
Quince, 2.0%	Very good	Unsatisfactory	Very good
Quince, 3.0%	Very good	Unsatisfactory	Very good
Tragacanth	Thick	Fair	Thick
Sodium alginate, 0.5%	Separation	Unsatisfactory	Thin
Sodium alginate, 1.0%	Separation	Unsatisfactory	Very good
Sodium alginate, 2.0%	Separation	Unsatisfactory	Very good
Methyl cellulose 15 CPS, 5.0%	Very good	Unsatisfactory	Very good
Methyl cellulose 15 CPS, 10.0%	Thick	Fair	Thick
Methyl cellulose 1500 CPS, 1.0%	Thin	Unsatisfactory	Very good
Methyl cellulose 1500 CPS, 5.0%	Thick	Unsatisfactory	Thick

(N. F. VI) calamine lotion and to suspend kaolin in a concentration of 20%. Suspension was obtained simply by trituration.

Table III is a summary of the results obtained from the suspensions.

GRANULATING AGENTS

Lots, to make 500 five-grain aspirin tablets, were granulated with each of the mucilages studied, and observations were made on granulation, on sieving, on compression, and on disintegration. In each step of the manufacture, the batches were graded (progressively downward) from "A" to "D."

Table IV indicates the comparative grades given for each mucilage to each section of the manufacture of the tablets.

NON-GREASY OINTMENT BASES

At the present time, there is an ever-increasing demand for non-greasy, water-soluble ointment bases. Since it was observed that the artificial gums resulted in very thick, sometimes semi-solid mucilages, a series of experiments was carried out to determine the concentrations of these gums necessary to produce bases of the consistency of ointments.

The concentrations, which will vary with both external and internal conditions, should be somewhere between the following limits:

(*a*) Sodium alginate	5.0% to 7.5%
(*b*) Methyl cellulose 15 CPS	15.0% to 20.0%
(*c*) Methyl cellulose 1500 CPS	10.0% to 15.0%

These bases are compatible with most of the ingredients which are used in the official ointments.

The effects of temperature were noted. In most cases an increase in temperature had little effect except to decrease slightly the viscosities of the mucilages. Mucilages of methyl cellulose were coagulated by high temperatures.

Light had no effect on any of the mucilages.

PRESERVATIVES

1. Formaldehyde (0.1%) was used throughout the study to preserve the mucilages. This preservative was entirely successful, but could only be recommended for use in preparations intended for external use.

2. Mucilages of methyl cellulose require no preservatives.

3. Para-hydroxybenzoic acid esters were recommended anonymously (7); and two of these esters, namely, benzyl-para-hydroxybenzoate and *n*-propyl-para-hydroxybenzoate in concentrations of 0.1% were studied and found to be successful in each case.

SUMMARY AND CONCLUSIONS

1. Results of this study indicate that mucilages from prepared and artificial gum sources are of equal pharmaceutical value to mucilages prepared from gums of natural sources.

2. Several drugs commonly called "gums" contain little or no water-soluble principles.

3. The mucilages studied were employed in the following pharmaceutical preparations:

As vehicles in various types of hand lotions.
As saponification agents.
As emulsifying agents.
As suspending agents.
As granulating agents (in tablet manufacture).
As moistening agents for pills.
As ointment bases.

(*a*) The official mucilages, those of acacia, tragacanth and chondrus, resulted in pharmaceutically acceptable preparations which make them worthy of inclusion in the Pharmacopœia and National Formulary.

(*b*) The other mucilages from natural gums which were studied were in most respects inferior to the official mucilages.

(*c*) In almost every case of pharmaceutical manufacture, it was possible to substitute a mucilage prepared from an artificial source for one prepared from a natural source without decreasing the pharmaceutical value of the preparation.

4. The mucilages of quince seed and sodium alginate were, of those studied, the most susceptible to incompatibility with the reagents tested; the official (U. S. P.) mucilages and those of karaya and methyl cellulose were the most stable to incompatibility with the reagents tested.

5. Formaldehyde (0.1%) acts as a preservative for the mucilages studied; or esters of para-hydroxybenzoic acid (0.1%) have excellent preserving powers when they are used in these muci-

TABLE II—GUMS AS EMULSIFYING AGENTS

	Liquid Petrolatum		Cod Liver Oil	
	Not Homogenized	Homogenized	Not Homogenized	Homogenized
Acacia	Creamed	Good	Very good	Very good
Chondrus	Creamed	Separated	Creamed	Good
Karaya	Fair	Fair	Fair	Fair
Okra	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory
Pectin	Separated	Good	Separated	Separated
Quince, 2.0%	Separated	Separated	Separated	Separated
Quince, 3.0%	Separated	Separated	Separated	Separated
Tragacanth	Good	Good	Separated	Separated
Sodium alginate, 0.5%	Separated	Separated	Separated	Separated
Sodium alginate, 1.0%	Separated	Separated	Separated	Separated
Sodium alginate, 2.0%	Separated	Separated	Separated	Separated
Methyl cellulose 15 CPS, 5%	Very good	Very good	Very good	Very good
Methyl cellulose 15 CPS, 10%	Very good	Very good	Very good	Very good
Methyl cellulose 1500 CPS, 1%	Separated	Separated	Separated	Separated
Methyl cellulose 1500 CPS, 5%	Separated	Separated	Separated	Separated

TABLE III—GUMS AS SUSPENDING AGENTS

	Suspension	
	Calamine	Kaolin
Acacia	Very good	Good
Chondrus	Unsatisfactory	Unsatisfactory
Karaya	Unsatisfactory	Unsatisfactory
Okra	Unsatisfactory	Unsatisfactory
Pectin	Good	Very good
Quince, 2.0%	Separated	Separated
Quince, 3.0%	Separated	Separated
Tragacanth	Thick	Thick
Sodium alginate, 0.5%	Good	Fair
Sodium alginate, 1.0%	Good	Fair
Sodium alginate, 2.0%	Good	Fair
Methyl cellulose 15 CPS, 5%	Good	Good
Methyl cellulose 15 CPS, 10%	Good	Good
Methyl cellulose 1500 CPS, 1%	Very good	Very good
Methyl cellulose 1500 CPS, 5%	Very good	Very good

TABLE IV—GUMS AS GRANULATING AGENTS

	Granulation	Sieving	Compression	Disintegration
Acacia	B	B	A	A
Chondrus	C	C	B	B
Karaya	A	A	A	A
Okra	D	C	B	A
Pectin	B	B	B	C
Quince, 2.0%	D	D	C	B
Quince, 3.0%	D	D	C	B
Tragacanth	C	C	B	D
Sodium alginate, 0.5%	C	D	B	A
Sodium alginate, 1.0%	B	B	A	D
Sodium alginate, 2.0%	C	B	B	A
Methyl cellulose 15 CPS, 5%	C	C	B	B
Methyl cellulose 15 CPS, 10%	B	B	B	D
Methyl cellulose 1500 CPS, 1%	A	A	A	A
Methyl cellulose 1500 CPS, 5%	C	B	A	D

lages. Mucilages of methyl cellulose require no preservative.

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